Static Charge Harvester

Abstract –

This technology uses static charge to harvest energy, you will have to go into the documents to understand what I mean, it’s not possible to explain this in 500 words.

This technology can act as a replacement to all power producing plants, which produce energy in large scale; it has unimaginable scope and potential. If this technology is used in a county for large scale production of electricity the country’s economy will boom to insane heights.

Here are some advantages of this technology –

* Energy production per unit area is negligible.
* Input cost in negligible.
* The systems can be over clocked to achieve peak demands, it has unlimited over clocking potential.
* Cost of maintenance is negligible.
* Flexible – can be used in verity of conditions.
* Hazards involved are less.
* Reliable – Can produce energy any time no matter how the climatic conditions are and is not dependent on natural resources.
* Speed of energy production is good.
* Does not cause any sort of pollution.
* Erection cost is less as compared to any large scale power producing plant of its order.

Its clear looking at the above advantages there is no reason not to use this technology. This technology is not fake, it has been tried and tested and its scope and consequence has been analyzed. This does not disobey any laws. I have contacted many organizations. I’m keenly interested of giving its license to the US government as I see that US is the organization that will gain maximum profits from this technology, it being the most power consuming nation.

I will see forward to release license to other countries in accordance to their power consumption.

The reviewer is recommended to have good knowledge of electrostatics for proper understanding of the documents. I have used many standard formulae many of which are related to capacitors. While reviewing the document the reviewer will have to keep in mind all the formulae. The reviewer can contact me at devakrit@gmail.com if facing problems.

You will have to fully review the documents in order to understand what it is. This technology will also help the US army in many aspects and by a lot, not only the US army, it has virtually unlimited potential.

This technology is unique, it’s a creative design therefore one of its kind. Since patent on it has been applied any copies of this technology does not exist. If such kind of technology had existed, it would undoubtedly replace all power producing plants. Also there was no support towards me to make this technology; it has been devised solely by me.

The documents defines the basic design of the invention, modifications might be made as per requirement. This design has been made simplest possible for a scientific individual to understand.

Finally, please don’t give up looking at the size of the documents (as many people did), I have made many figures for top understanding of the design.

Patent on this technology has been applied (application no.:– 2110/del/2007). This patent, though is not a US patent (applied in India), has availability to all PCT members (since India is a member of PCT).

Goals of DOE and its accomplishment by this technology –

**“Energy Security:** Promoting America’s energy security through reliable, clean, and affordable energy**”**

It can be seen in the advantages that this is a reliable, clean and affordable energy source.

**“Nuclear Security:**  Ensuring America’s nuclear security**”**

Since this technology will act as a replacement of nuclear sources, removal of nuclear power plants is the best possible way to ensure security.

**“Scientific Discovery and Innovation:**Strengthening U.S. scientific discovery, economic competitiveness, and improving quality of life through innovations in science and technology**”**

As said in the abstract this machine will aid economic competitiveness since the use of this technology will provide an economic boom to the US economy. Since this is a result of scientific research it is strengthening U.S. scientific discovery, since its license will be released to the U.S.

This technology will stash electricity bills by a fraction, improving quality of life dramatically, since this is a breakthrough in R&D.

**“Environmental Responsibility:**Protecting the environment by providing a responsible resolution to the environmental legacy of nuclear weapons production**”**

All nuclear hazards will be awarded as this will act as a replacement to all power producing nuclear sources.

**“Management Excellence:**Enabling the mission through sound management**”**

After the release of the license management of this technology’s potential is solely the responsibility of the US government, thus the inventor or the technology can’t help much accept. On the inventor’s part, he can only provide sound advice.

Details of the inventor/Other info. –

Name: -                        Devakrit

Date of birth – 15th April 1989

Qualification – High school (ISC)

Current status – Engineering student

Nationality – Indian

Contact No. –              +919960191290

Permanent address/Address of correspondence: -             94 Nalapani road,
                                                                                     Dehradun,
                                                                                     Uttrakhand,
                                                                                     India.

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Business                                                                        License distribution

Starting date                                                                  Around the beginning of 2008

Period of performance                                                    unlimited

Proposal end date                                                          10/9/2027

Period for which proposal is valid                                     ~20 years

Bibliography –

Online sources have been taken as the knowledge base for creation of this technology. Most of the theories are self made, so the sources required were less. This technology has only been verified by many scientists, support of any personal other than specified was not used.

Objectives

The objective of this technology is to end all power crisis, pollution problems regarding power production and reduce cost op power production in large scales.

Qualification of the reviewer required

The reviewer is recommended to have good knowledge of electrostatics for proper understanding of the documents. I have used many standard formulae many of which are related to capacitors. While reviewing the document the reviewer will have to keep in mind all the formulae.

!!Important!!

### If this is the word document you are reading (extension - .doc) view it in web layout. Since the images are large you will have to use the horizontal scroll, always view the images as a whole, don’t take assumption of what will be on the sections of the image which cannot be seen without the use of horizontal scroll. Many images might look same from some angle, but each image is unique; so you have to view all sections of each image.

Decoding the diagrams –

*Color coding –*

Different components have been colored differently and their name (that is a number like 1, 5, 6, 13 etc…) has also been colored in their respective components colors. The lines which mark a component are in red color.

*Diagram nomenclature –*

Some name of the figures have a reason behind it, for many diagrams after the term ‘figure’ I have written which axis does the figure show, at what sate is it, it’s to be noted that this logic for referring the figures has been adopted for some figures only. Also for most of the diagrams, which I have used to clarify a description are in state 1 (described later).

**Component description –**

*14, 16, 8, 15 (can be called as ‘belt’ combined)* – These components are made up a high strength insulating material and as seen in the figures; are interconnected to make a belt x in length ( the whole 14, 16, 8, 15 can be called as a belt) (see figure 6). There sections represent different parts in the belt, sections 15 and 16 represent a component of this belt where a conductor in coated as a layer on them (towards the inner side, i.e. facing the inner side of the machine) (see figure s). This coating should be flexible, i.e. shouldn’t break when the belt is made to move on 1, 2, 12, 10. All the coating should be to 1 side of the belt. This belt is not open but circular in shape (that is ends are connected). The belt should be good enough to handle the tension required on it. The tension should be good enough for 15, 16 not to slack in the direction of plates 6 or 13 due to high electrostatic forces of attraction. The belt should be designed as to withstand high surface tension as described above. Total length of this belt is x. The total energy production might depend on the size of belt.

This figure gives the view of the belt (14, 16, 8, 15 laid flat)

Length of belt (x)

Figure 6

This figure gives special emphasis on the belt to describe which side of the belt has the conducting layer.

Insulator part

Conductor part

16

Figure – s

1

4

2

7

5

6

10

8

13

12

14

15

16

Insulator part

Conductor part

15

14

8

Insulator part

Insulator part

Insulator part

Insulator part

4

3

9

11

*1, 2, 12, 10* – These 4 pulleys, which rotate about an axis, provide the required shape and movement to 15, 14, 16, 8 for the proper working of the machine. The radius of these pulleys is r, and length along z axis is equal to the width of 15 or 14 or 16 or 8 (along z axis) that is a+b. The tensile strength of these components (1, 2, 12, 10) should be enough to handle the tension on 15, 14, 16, 8 or the belt. The tension should be good enough for 15, 16 not to slack in the direction of plates 6 or 13 due to high electrostatic forces of attraction. The belt should be designed as to withstand high surface tension as described above. The radius of 1, 2, 12, 10 should be such that maximum possible radius can be achieved without 1 and 2 touching each other or 12, 10 touching each other, It can also be said that j should not be equal to 0. Also n should be of desirable value (all this has been explained later). This has to be done to avoid wear and tear since larger pulleys will have less RPM and finally wear down less, also this will increase the tensile strength of the pulleys. However the total energy production does not depends on the size of the pulley, but the economy does.

3-d view of one of the pulleys (1) separated from rest of the machine.

Figure – r

1

5

6

8

10

12

13

14

15

16

2

7

1

r

*5, 6, 7, 13* – These are conducting plates having x-axis length of x/4 and z axis length of a. The thickness of these plates will vary as per requirements. These components will be used to store high amounts of charge. The total energy production might depend on the size of these components.

Figure gives special emphasis on dimensions of 6, which is the same as 5, 7, 13.

Figure – a

1

5

6

8

10

12

13

14

15

16

2

7

a

x/4

*3, 4, 11, 9* – The one and only job of these components is to connect 16, 15 to earth when required, that is when the 16 or 15 has come into the vicinity of electric field of 6 or 13, to provide proper shielding to 5 and 7. To earth 16, 15; 4 grounded conducting pulleys have been made to roll on the belt for this purpose, as a result 14, 8 also get rolled over by these pulleys. When the 16, 15 has come in between 6 or 13; 3, 4, 11, 9 will be rolling on 16, 15 and will earth it. 3, 4, 11, 9 needs to be made so as to ground the area of the belt which it’s in contact with it. 4 pulleys have been provided to ensure the 16, 15 always stays grounded when desired. Largest possible radius of this component should be achieved to avoid wear and tear, It has a radius of r1.

Figure gives special emphasis on dimensions of 3, which is the same as 4, 11, 9.

Figure – r1

1

4

2

3

7

5

6

9

10

11

13

12

15

16

8

14

r1

3

8a

15

Variable description table –

|  |  |  |
| --- | --- | --- |
| **Variable** | **Definition** | **Formula** |
| r | Radius of 1, 2, 12, 10 (view figure r) | The radius of 1, 2, 12, 10 should be such that maximum possible radius can be achieved without 1 and 2 touching each other or 12, 10 touching each other, It can also be said that j should not be equal to 0. Also n should be of desirable value |
| h | Overall height of machine (X axis) | $$(4r+2n+\frac{x}{4})$$ |
| x | Total length of belt, i.e. if the belt is taken off 1, 2, 12, 10 and laid flat on a surface, the largest non –diagonal straight line distance is x. This has been shown in figure 6 | $$4h-8r-8n$$ |
| n | If we draw a tangent on 1, 2, 12, 10 such that this tangent is parallel to area vector of 5 and closest possible to 5 (if 1 and 12 are considered) or 7 (if 2 and 10 are considered), then the straight line distance between this tangent and another line drawn on 5 (if 12 and 1 are considered) or 7 (if 2 and 10 are considered) such that this line is parallel to area vector of 5 and exists on the uppermost edge of 5 (if 1 is considered) or 7 (if 2 is considered) or lower most edge of 5 (if 12 is considered) or 7 (if 10 is considered) will be called n (shown in figure n) | Might be a constant if h is not equal to 0 for a desired value of n. |
| j | Assume a tangents on 1 and 2 or 12 and 10 such that they are perpendicular to area vector of 5, now 2 such tangents exist on 1 or 2 or 12 or 10, out of these 2 tangents only one tangent on each pulley is to be considered, the tangent to the innermost side of the machinery is to be considered (it should not trace the path of the belt); then the shortest straight line distance between the tangents of 1 and 2 or 12 and 10 is j(shown in figure j) | $$(\frac{x}{4}-2n-4r-πr)$$ |
| d | Linear distance between 14 and 5 or 8 and 13 (in state 1), in general gap between 6, 13 and the belt. (shown in fig. d) | Constant |
| d1 | Linear distance between 6 and 5 or 7 and 8. (view figure d1) | Constant |
| a | Z axis with of plates 6, 5, 7, 13 width. This variable is such that $\frac{x}{4}\*a=area of 6 or 5 or 7 or 13$ (view figure a) | Constant |
| b | This is the additional width that 15 or 14 or 16 or 8 has as compared to 6, 5, 7, 13 thus making the total width as $a+b$ (view figure b – this is the cross sectional view of the belt) | Constant |
| r1 | Radius of 3, 4, 11, 9 (see figure r1) | Largest possible size should be achieved to avoid wear and tear |
| v1 | Maximum potential difference on 6, 13 with respect to earth | Constant |
| v2 | Maximum potential difference on 16, 15 with respect to earth | ~- v1 (if d1 – d is less) |
| v3 | Maximum potential difference on 5, 7 with respect to earth | ~-v1 (if d1 is less) |
| E | Electric field between 15, 16 and plate 6, 13 (state 1, same for state 3) | ~2 v1/d |
| E1 | Electric field between plate 6 and 5, 13 and 7 |  (V1-V3)/d1 |
| ΔE | Difference of the E.F falling on the 15, 16 and plates 5, 7 from 13 and 6 | E-E1 |
| F | Y axis force generated on the 15, 16 by plate 6, 13 | Can be ignored…formula has no utility |
| Q | Charge stored between plate 6, 16 and 15, 13 or 6, 15 and 16, 13 | C(V1-V2) |
| C1 | Capacitance of plates 6, 5 and 13, 7 | (ε0(x/4\*a))/d1 |
| C | Capacitance between 13, 15 and 16, 6 or 13, 16 and 15, 6 | (ε0(x/4\*a))/(d1-d) |
| Enbc | Energy stored between 6, 5 and 7, 13 in states 1 or 3 | (1/4)\*(V1-V3)2\*C1 |
| Ens | Energy stored between plates 6, 15 or 13, 16 or 6, 16 or 13, 15 in states 2 or 4 | (1/4)\*C\*(V1-V2)2 |

Figure – r

1

5

6

8

10

12

13

14

15

16

2

7

1

r

Length of belt (x)

Figure 6

Figure giving description of the variable n

n

Figure – n

1

2

7

5

6

10

8

13

12

14

15

16

5

15

9

11

4

3

Discription of variable j –

j

Figure – j

1

2

7

5

6

10

8

13

12

14

15

16

1

2

15

9

11

4

3

Description of d

d

Figure – d

1

4

2

7

5

6

10

8

13

12

14

15

16

5

14

9

11

4

3

Description of d1

d1

Figure – d1

1

2

7

5

6

10

8

13

12

14

15

16

5

6

9

11

4

3

Figure – a

1

5

6

8

10

12

13

14

15

16

2

7

a

x/4

Figure gives special emphasis on description of a, b and its comparison.

Figure – b

1

5

6

8

10

12

13

14

15

16

2

7

b

a+b

a

Cross sectional views of 6 and 15 compared

Figure – r1

2

4

1

3

7

5

6

9

12

11

13

10

15

16

8

14

r1

3

8

15

Construction –

First consider the distance between 1, 2, 10, 12; each is of radius r. The X axis distance between the center of pulleys 1 and 2 or 12 and 10 is $2r+j$. The Y axis distance between center of pulleys 1 and 12 or 2 and 10 is $x/4+2n+2r$. All figures have been drawn to follow the formulae, also the formulae given in the variable description table. If a line is drawn from the center of 1 to 2 and 10 to 12 (of length $2r+j)$ and another line is drawn from the center of 1 to the center of 12 and from the center of 2 to the center of 10 (of length $x/4+2n+2r$), it will from a rectangle (see figure. 1, 2, 10, 12)

For understanding, clear view of 1, 2, 10, 12 relative to each other

$$x/4+2n+2r$$

$$x/4+2n+2r$$

$$2r+j$$

$$2r+j$$

Figure – 1, 2, 10, 12

Line joining center of circle forms a rectangle

1

10

12

2

Now since the pulleys have been placed, 14, 16, 8 and 15 can now be positioned on them. Considering the belt is 100% inelastic, and after the belt has been placed on the pulleys and acquired a shape, the X axis length of the belt (excluding the area of the belt in contact with 1, 2, 12, 10) between pulleys 1 and 2 or 3 and 4 is $2r+j$ and between 1 and 12 or 2 and 10 is $x/4+2n+2r$ (excluding the area of the belt in contact with 1, 2, 12, 10). The length defined can also be expressed as the length of the common tangent between any 2 adjacent pulleys, where one of the tangents ends where the other begins. It’s to be noted that out of 2 such common tangents only the tangent which is to the outside of the system (the tangents having maximum distance from plate 13 or 6) is to be considered (see figure 14, 16, 8, 15). The sum of all these lengths comes out to be $x-2πr$ cm; the remaining $2πr$ is in contact with the pulleys (which has been excluded from the tangential lengths). 15, 14, 16 and 8 are placed on the pulleys such that there are no sections of belt or pulleys which can be seen separately if seen along Z/X or Z/Y, to be more specific only 3 sections of the belt can be seen at most when seen along Z/X and at most 2 sections can be seen along Z/Y axis that too when the machine is not in any one of the states (when its changing its state), overall we come to a conclusion that the belt and 1, 2, 10, 12 perfectly fit on each other. Now the belt can be rotated over 1, 2, 10, 12. A stationary object in the surroundings of the system can act as the axis of these pulleys; the axis of each pulley needs to be individual. The sole belt and pulley arrangement can be seen in Figure – all.

Figure describing the path traced by the belt on 1, 2, 12, 10

$$x/4+2n+2r$$

$$x/4+2n+2r$$

$$2r+j$$

$$2r+j$$

Figure – 14, 16, 8, 15

1

10

12

2

Common tangent between 1 and 2 as described in the theoretical description, this line also traces the path of the belt

Common tangent between 1 and 12 as described in the theoretical description, this line also traces the path of the belt

Common tangent between 12 and 10 as described in the theoretical description, this line also traces the path of the belt

Common tangent between 2 and 10 as described in the theoretical description, this line also traces the path of the belt

Clear diagram of how the belt is placed on 1, 2, 12, 10

Figure – All

8

14

15

16

1

10

12

2

Belt

Plates 13, 6 have an independent suspension, its placed along the Z axis width of the 15 or 14 or 8 or 16 such that the Z axis length of the pate is ‘a’ and Y axis length of the belt is x/4, only the thickness of the plate lies on the X axis. Special emphasis has been placed in the dimensions of the 13, 6 in figure – a (scroll up). As for the Y axis placement of 13, 6, is placed such that n+2r units of the belt on the lower side (i.e. towards 12 in case of 6 and 10 in case of 13) and n+2r units of the belt on the upper side (i.e. towards 1 in case of 6 and 2 in case of 13) are visible if seen facing 13 or 6 (see figure 21 and 22). Overall it can be said that 13, 6 are the middle of the tangential length of the belt along Y axis (tangential length has been described earlier). 13, 6 have been placed with respect to the belt along Z axis such that b units of the belt can be seen as to emerge from 13 or 6 to the left hand side of 6 or right hand side and 13. Thus b is the additional width that the belt shares with respect to 13 or 6 (see Figure 21 and 22). This additional with is only to one side of the belt that is left hand side of 13 or right hand side of 6. The minimum X axis distance between 13 or 6 and belt is d1 – d. Figure – belt+plates shows components 13 and 6 added with Figure all.

Clear view of the variable ‘b’ when seen along Z/Y axis facing 13.

Figure 21

8

16

13

15

Additional width of b units to the RHS facing 13

n+2r units of the belt on the lower side

n+2r units of the belt on the upper side

Clear view of the variable ‘b’ when seen along Z/Y axis facing 6.

Figure 22

15

6

16

14

Additional width of b units to the LHS facing 6

n+2r units of the belt on the lower side

n+2r units of the belt on the upper side

Figure – a

1

5

6

8

10

12

13

14

15

16

2

7

a

x/4

Figure describing overall placement of 6, 13 relative to the belt.

Figure – belt+plates

1

6

8

10

12

13

14

15

16

2

5, 7 are conducting plates which are located further inside the arrangement, i.e. in the side opposite to that of 6 or 13 respectively with the belt in between. The 2 plates have been earthed. The X axis distance between 5 or 7 and the belt is d (shortest)(shown in figure d). The distance shortest between 6 and 5 or 7 and 13 is d1(shown in figure d1). Dimensions of 5 and 7 are same as 6 or 13. The y axis placement of 5 and 7 is same as that of 6 and 13 respectively. The Z axis’s placement is too identical to 6 and 13 respectively. Addition of this component to Figure – belt+plates will complete all the components shown in Figure – X/Y/Z, state 1, 6 LHS. View Figure – X/Y/Z, state 1, 13 LHS, 7 edit and Figure – X/Y/Z, state 1, 6 LHS, 13 edit

Special emphasis has been given to placement of 7, 5 in this figure, viewing from side of component 6, certain components have been deleted in order to show this.

Figure – X/Y/Z, state 1, 13 LHS, 7 edit

2

1

3

4

15

5

8

9

10

11

12

14

16

7

Special emphasis has been given to placement of 7, 5 in this figure, viewing from side of component 13, certain components have been deleted in order to show this.

Figure – X/Y/Z, state 1, 6 LHS, 13 edit

1

8

10

12

13

15

16

2

7

5

Figure – X/Y/Z, state 1, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

3, 4, 9, 11 are positioned in contact with the extra b units length of the belt. If a line parallel to the area vector of 6 or 13 is made to made to project from 13’s right most top edge on the belt it touches the area which will be in contact of 3, if the lower most right edge of 13 is considered for projection of this line on the belt it touches the area of contact of 9. If this same line (parallel to the area vector of 6 or 13) is made to made to project from 6’s left most top edge on the belt it touches the area which will be in contact of 4, if the lower most left edge of 6 is considered for projection of this line on the belt, it touches the area of contact of 11 (see figure – contact). The radius of 3, 4, 9, and 11 is r1 (see Figure– r1). The width of the 3 or 4 or 9 or 11 is b, i.e. part of width the belt which does not correspond to the width of 6 or 13 (see figure w). It rolls on the very same extra b units width of the belt, which as described earlier seems to emerge from 6 and 13 (see figure 51). It can be said that the contact area as described above is the point from where 3, 4, 9, and 11 start.

Figure describing placement of 3 on the belt, which is nearly same as 4, 11, 9 relative to 13.

Figure – Contact

1

4

2

3

7

5

6

9

10

11

13

12

15

16

8

14

Line parallel to the area vector of 6 or 13

3

8

13

15

Point of contact

Figure giving zoomed view of dimensions of 4 which is same as 3, 9 and 11.

b

Figure – W

2

1

3

4

15

5

8

9

10

11

12

13

14

16

Figure describing at which points does 4 start and end.

Figure – 51

2

1

3

4

15

5

8

9

10

11

12

13

14

16

4

15

14

b

States of the system –

The working of the system has been divided into 4 states, namely state 1, 2, 3 and 4. The difference between the states are the charge distribution differences among the plates namely 7 and 5 , the positioning of 15, 14, 16 and 8 (as it moves around the whole system as a belt, in other words positioning of different sectors of the belt) and the charge on 15 and 16. Rest of the components remain stationary, accept the rotator motion of 1, 2, 12, 10, 9, 11, 4 and 3; they don’t change their places. Since this machine works in cycles 1 cycle is complete with the completion to all the 4 states, the order how the state changes are as such –

Considering the system starts at state 1, as it proceeds forward it enters state 2 then state 3 then state 4 and finally back to state 1, from where the cycle again begins or it marks the completion of 1 full cycle.

Working –

Only 2 components in this system have a constant charge throughout the working of the machine, which is 6 and 13. 6 and 13 can be made to gain charge by the help of a van de Graff, this has been discussed later in the additional advice section. For convenience consider the initial state of the system as state 1. Considering this charge on 6, 13 and its consequences on other parts of the machine, we can analyze how the machine will work.

View of the machine along X/Y axis with 6 in Left hand side and machine at state 1.

Figure – X/Y, state 1, 6 LHS

1

4

2

3

7

5

6

10

8

13

12

14

15

16

9

11

4

3

View of the machine along X/Y axis with 13 in Left hand side and machine at state 1.

Figure – X/Y, state 1, 13 LHS

1

4

2

3

7

5

6

9

10

11

13

12

15

16

8

14

3-d view of the machine with 13 in Left hand side and machine at state 1.

Figure – X/Y/Z, state 1, 13 LHS

2

1

3

4

15

5

8

9

10

11

12

13

14

16

3-d view of the machine with 6 in Left hand side and machine at state 1.

Figure – X/Y/Z, state 1, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

Z/Y axis view of the machine facing 1 and 2 (or top view) at state 1.

Figure Z/Y, 1, 2 state 1

15

Z/Y axis view of the machine facing 12 and 10 (or bottom view) at state 1.

Figure Z/Y, 12, 10 state 1

16

Z/X axis view of the machinery facing 6 at state 1.

Figure Z/X, state 1, 6

15

6

16

14

Z/X axis view of the machinery facing 13 at state 1.

Figure Z/X, state 1, 13

15

16

13

8

Since at state 1 the belt is positioned such that its insulator section is facing plate 6 and 13, electric field produced due to 6 and 13 will pass through the belt and finally have its effects on plate 5 and 7 respectively (insulator does not hinder the path of the electric filed). This electric field will induce an opposite charge to that of 6 and 13 since both plates 5 and 7 have been grounded (see Figure – Explanation State 1).

Diagrammatic explanation of the path traced by the electric field at state 1.

Figure – Explanation State 1

1

4

2

3

7

5

6

10

8

13

12

14

15

16

9

11

4

3

Since this section (14) of the belt is an insulator, it will let pass all electric field though it.

5 is a conducting plate which is grounded, so when 6’s electric field fall on it, due to laws of induction 5 gets induced by a net opposite charge with respect to 6.

This plate (6) has a permanent charge; it won’t change throughout the working of the machine.

Electric field produced by 6. The electric field produced by it will move towards 5 as 5 has 0 potential and 6 has a potential, so there is a potential difference which distracts the electric field.

Charges induced on 5 and 7 have been derived –

Assume V1 as known

### Computation of V3

Explaining the instance of the machine diagrammatically, this is the scenario considered in the derivation –

d

d1

6

14

5

Figure – Component 1

d is known; after finding E1, V3 can be found out

Assume V3 to be at 0 potential. In this case E.F calculated will come out to be half of E1, but plate V3 is connected to earth and will produce an equal E.F to that of the E.F falling on it.

Assuming V3’s P.D. to be 0

(E1)/2 = V1/d1 (Standard formula used E = v/d)

E1 can now be found; Since E1 is known V3 can also be found

E1 = (V1-V3)/d1 (Standard formula used E = v/d)

V3=V1-E1d1

Now consider the system entering state 2 -

Figure – X/Y, state half 2, 6 LHS

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3-d view of the system entering state 2 –

Figure – X/Y/Z, state half 2, 6 LHS

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16

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As components 15 and 16 enter the vicinity of the electric field of plates 6 and 13 respectively, they are also grounded by 4 and 9 respectively (remember 15 and 16 are sections of the belt coated with a conductor towards the inner side), thus as components 15 and 16 enter further between 6 and 13 respectively, it acts as a sort of electric shield to 5 and 7 respectively (as 15 and 16 get induced by an equal and opposite charge with respect to 6 or 13, due to phenomenon of charge induction, all electric field produced by 6 and 13 gets terminated at 15 and 16); as a result the electric flux that 5 and 7 received from 6 and 13 reduces (flux does not become 0 as sections of 5 and 7 which have not been yet covered by 15 and 16 are still exposed to electric field produced by 6 and 13), thought the flux density remains the same. As 15 and 16 further move between 6, 5 and 7, 13; the total flux falling on 5 and 7 also reduces, due to this loss in flux a current continuously flows from 5 and 7 to earth as the total charge stored on each of the plates are reducing. This happens because initially; as explained in state 1; 5 and 7 are induced by a charge, this induced charge was being held by 6 and 13 until 15 and 16 moved between 6, 5 and 7, 13 respectively; ultimately releasing the grip of the electric field of 6 and 13 form 5 and 7. Now, since there is nothing to hold the charge on 5 and 7 it will flow to earth since 5 and 7 are earthed). This current is directly proportional to the velocity at which the 15 and 16 enter the vicinity of 6 and 13’s electric field as the higher the speed at which the belt rotates (i.e. higher the speed of 15 and 16 enter the vicinity of 6 and 13’s electric field) faster will be the discharge of 5 and 7, since 5 and 7 are discharging faster, the current flow will be higher. If the friction of the pulleys are ignored the belt can be moved with no force, in fact this motion will be aided and governed due to a fact which has been written later. The conclusion of this force is that if d is less this force can be neglected. It’s to be also noted that the current flowing from 5 and 7 to earth will be stable considering there are no fluctuations in the speed of the rotation of the belt. Since electric field is also acting on 15 and 16 it will now get induced by a charge and the flux falling on 15 and 16 will increase as it moves further between 6, 5 and 13, 7 (15 and 16 have a conducting layer on it, as said before). It can be said that the effects of this movement on 15, 16 and 5, 7 are inverse, 15, 16 gets charged while 5, 7 gets discharged. Also current will flow between earth and 15, 16 and will have opposite natures to that of the current flowing between earth and 5, 7 but the factor controlling the charge flow will be the same, that is directly proportional to the velocity of the belt; this current too is stable (flowing between 15 and 16 and earth) considering the belt has a constant velocity of movement (see Figure – Explanation State half 2).

Diagrammatic explanation of the path traced by the electric field when a transaction is taking place in the machine form state 1 to 2.

Figure – Explanation State half 2

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Since this section (14) of the belt is an insulator, it will let pass all electric field though it.

Since section 15 has a conducting layer on it, it will get induced by an equal and opposite charge to that of 6, since now it’ll be charged, it will distract some of the electric field from 6 to itself, allowing no electric field on some sections of 5 (the sections which have not been overlapped by 15).

This plate (6) has a permanent charge; it won’t change throughout the working of the machine.

5 is a conducting plate which is grounded, so when 6’s electric field fall on it, due to laws of induction 5 gets induced by a net opposite charge with respect to 6. In this case when not all Electric field from 6 fall on 5 (due to presence of 15), the net charge in this plate is less as compared to state 1. This charge will continue to reduce as the machine moves forward to state 2 (because 15, which is distracting some of the electric field towards it).

Electric field produced by 6. Some of the electric field produced by it will move towards 15 as 15 has 0 potential and 6 has a potential, so there is a potential difference which distracts the electric field. Now the electric field, in this case will show a preference for 15 (only for the sections of 5 which has been over lapped by 15), not 5 as 15 is in the way of 5 and has gained an equal and opposite charge due to laws of induction (Remember 15 is grounded by 4). 15 will act as an electric shield overall.

The electric field emitting from this section of 6 does not have 15 in its way, it has the insulator section of the belt in its way, which it gets passed through easily, thus the effects of 6’s electric field is prominent on some sections of 5 (sections which have not been overlapped by 15). As the belt will advance forward, this described section above will decrease in size as 15 will overlap it.

Due to this discharge of 5 (because the electric flux will decrease on 5 as 15 advances); since 5 is grounded, charge will flow from 5 to earth.

Now consider the system has reached state 2, that is 15 and 16 are completely in between 6, 5 and 7, 13. At this point no electric field effects 5 and 7 as all the electric field has been distracted by 15 and 16 (in other words all E.F terminates at 15 and 16), at this point the electric flux falling on 15 and 16 is maximum, as a result the forced experienced by 15, 6 and 13, 16 is maximum at this state (the same force also acts at state 4). This is the Columbian force of attraction (see Figure – Explanation state 2 and Figure – X/Y, state 2, 6 LHS, forces).

Diagrammatic explanation of the path traced by the electric field at state 2.

Figure – Explanation state 2

1

2

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15

16

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4

3

This plate (6) has a permanent charge; it won’t change throughout the working of the machine.

Since section 15 has a conducting layer on it and is grounded, it will get induced by an equal and opposite charge, since, now it’ll be charged, it will distract all the electric field from 6 to itself, allowing no electric field to fall on 5.

In this case when 5 experiences no electric field (as all electric field has been distracted towards 15) and is grounded, it has no net charge.

At this state, when all the electric field from 6 falls on 15 (as 15 is equal to the dimensions of 6) 15 has the maximum possible net charge (which is equal to its charge at state 4). Because of 15 is grounded, it will gain an equal and opposite charge as compared to 6, since its grounded it will allow no electric field to pass through itself, leaving 5 isolated form charge. Overall 15 acts as an electric shield to 5.

View of the machine along X/Y axis with 6 in Left hand side and machine at state 2, showing the forces of attraction between 6, 15 and 16, 13.

Figure – X/Y, state 2, 6 LHS, forces

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16

9

11

4

3

Columbian force of attraction

Columbian force of attraction

View of the machine along X/Y axis with 13 in Left hand side and machine at state 2.

Figure – X/Y, state 2, 13 LHS

1

4

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11

13

12

15

16

8

14

View of the machine along X/Y axis with 6 in Left hand side and machine at state 2

Figure – X/Y, state 2, 6 LHS

1

2

7

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6

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8

13

12

14

15

16

9

11

4

3

3-d view of the machine with 13 in Left hand side and machine at state 2.

Figure – X/Y/Z, state 2, 13 LHS

2

1

3

4

15

5

8

9

12

11

10

13

14

16

3-d view of the machine with 6 in Left hand side and machine at state 2.

Figure – X/Y/Z, state 2, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

Z/Y axis view of the machine facing 12 and 10 (or bottom view) at state 2.

Figure Z/Y, 12, 10, state 2

14

Z/X axis view of the machinery facing 6 at state 2.

Figure Z/X, state 2, 6

15

6

14

8

Z/Y axis view of the machine facing 1 and 2 (or top view) at state 2.

Figure Z/Y 1, 2, state 2

8

Z/X axis view of the machinery facing 13 at state 2.

Figure Z/X, state 2, 13

14

8

13

16

Since the belt is moving it won’t stay in this state, it will proceed to state 3 –

Figure – X/Y, state half 3, 6 LHS

1

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16

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11

4

3

3-d view of the system entering state 3 –

Figure – X/Y/Z, state half 3, 6 LHS

1

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14

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16

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When the machine will start reaching state 3 the insulator sections of the belt (8, 14) gets inserted between 6, 5 and 13, 7 respectively. As a result electric field of 6 and 13 resumes to fall on 5 and 7 respectively (since insulator lets electric field to pass through it), as 8 and 14 go forward between 6, 5 and 7, 13 the flux falling on 5 and 7 will increase since components 15 and 16 are moving out from between 6, 5 and 7, 13 and the electric shielding effect of 15 and 16 is getting reduced (see Figure – Explanation state half 3).

Diagrammatic explanation of the path traced by the electric field during the transaction period of the machine from state 2 to 3.

Figure – Explanation state half 3

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12

14

15

16

9

11

4

3

Since this section (8) of the belt is an insulator, it will let pass all electric field though it.

Since section 15 has a conducting layer on it, it will get induced by an equal and opposite charge to that of 6, since now it’ll be charged, it will distract some of the electric field from 6 to itself, allowing no electric field on some sections of 5 (the sections which have not been overlapped by 15).

This plate (6) has a permanent charge; it won’t change throughout the working of the machine.

5 is a conducting plate which is grounded, so when 6’s electric field fall on it, due to laws of induction 5 gets induced by a net opposite charge with respect to 6. In this case when not all Electric field from 6 falls on 5 (due to presence of 15) the net charge in this plate is less as compared to state 1. This charge will continue to increase as the machine moves forward to state 3 (because 15, which is distracting all electric field towards it, is moving away increasing the effective area between 6 and 5).

Electric field produced by 6. Some of the electric field produced by it will move towards 15 as 15 has 0 potential and 6 has a potential, so there is a potential difference which distracts the electric field. Now the electric field, in this case will show a preference for 15 (only for the sections of 5 which has been over lapped by 15), not 5 as 15 is in the way of 5 and has gained an equal and opposite charge due to laws of induction (Remember 15 is grounded by 11). 15 will act as an electric shield overall.

The electric field emitting from this section of 6 does not have 15 in its way, it has the insulator section of the belt in its way, which it gets passed through easily, thus the effects of 6’s electric field is prominent on some sections of 5 (sections which have not been overlapped by 15). As the belt will advance forward, this described section above will increase in size as 15 will leave the area between 6 and 5.

Due to this recharge (because the electric flux will increase on 5 as 15 advances) of 5; since 5 is grounded, charge will flow from 5 to earth.

Now the machine will enter state 3.

View of the machine along X/Y axis with 6 in Left hand side and machine at state 3.

Figure – X/Y, state 3, 6 LHS

1

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12

15

16

14

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11

4

3

View of the machine along X/Y axis with 13 in Left hand side and machine at state 3.

Figure – X/Y, state 3, 13 LHS

1

4

3

7

5

6

9

10

11

13

12

15

16

8

14

2

3-d view of the machine with 13 in Left hand side and machine at state 3.

Figure – X/Y/Z, state 3, 13 LHS

2

1

3

4

15

5

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8

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12

11

10

13

14

16

3-d view of the machine with 6 in Left hand side and machine at state 3.

Figure – X/Y/Z, state 3, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

Z/Y axis view of the machine facing 1 and 2 (or top view) at state 3.

Figure Z/Y, 1, 2 state 3

16

Z/Y axis view of the machine facing 12 and 10 (or bottom view) at state 3.

Figure Z/Y, 12, 10, state 3

15

Z/X axis view of the machinery facing 6 at state 3.

Figure Z/X, state 3, 6

15

6

8

16

Z/X axis view of the machinery facing 13 at state 3.

Figure Z/X, state 3, 13

15

16

13

14

Due to these reasons (electric field of 6 and 13 starts falling on 5 and 7) 5 and 7 (since they are grounded) will have a charge flow between itself and earth (principles of charge induction) and will slowly get induced with a charge as the belt rotates. At the same time 15 and 16 will lose charge to earth since they are grounded and the total electric flux falling on 15 and 16 will decrease (since the effective area between 15, 6 and 16, 13 has been reduced and consequently the charge stored on 15 and 16 has reduced), again the current intensity between 5, 7 and earth and 15, 16 and earth will be directly proportional to the velocity of rotation of belt, which will in turn increase the velocity at which 8 and 14 will get inserted between 6, 5 and 7, 16 respectively. A question comes to our mind, as, why not will a force act on 15 and 16 as they move away from between 6, 5 and 7, 13. The reason for this is as follows –

For this purpose first E needs to be figured out –

### Computation of E-

Assuming (V1-V2) is known -

E = (V1-V2)/d (Standard formula used E = v/d)

### Force on conducting shield while it moves down (Y component force only)

6

d

d1

5

8

15

Figure – Component 2

Consider the 15, 16 moving away from between plates 6, 5 and 7, 13. When the conducting shield starts moving down, under absence of plates 5 when 6 and 15 are considered and 7 when 16 and 13 are considered, E and (V1-V2) should remain constant the reason being 6 and 13 and 15, 16 are both conductors, i.e. sea of electrons, the electrons move to any part of plate which has a positive electric flux, but due to plate 5 and 7, E gets disturbed. Initially V3=0, when E.F from 6 and 13 falls on 5 and 7, it will get induced with an equivalent charge (depending on the distance between 6, 5 and 7, 13) and E.F. produced will be more intense (twice the intensity) with respect to the electric field falling on 5, 7 when it had 0 potential. Now due to 15, 16’s movement charge on 6, 13 will move within their own medium, but intensity of this charge will depend on (d), more the distraction (less the distance between 15, 5 and 16, 7) lesser charge will move with 15 and 16, as this charge will be held by 5, 7. The charge that will move will be equivalent to the difference of the E.F falling on the 15, 16 and plate 5, 7 (ΔE). Force will only start acting after this-

d

d1

5

8

15

Figure – Component 3

When the shielding plate has withdrawn from between 6, 5 and 7, 13 i.e. it will pull up the plate with an equivalent force of ΔE

Simultaneously the charge induced on 15 and 16 will decrease and will be equivalent to ΔE since ΔE now is the only E.F acting on the 15 and 16; therefore the attractive force will decrease further. Also ΔE will decrease still more in intensity as the 15 and 16 now has lesser charge induced now (only ΔE). Over all if (d) is less this force can be neglected.

ΔE=E-E1

The force acting will be -

F=1/2Q ΔE (Standard formula…force on the plates of a capacitor $F= \frac{1}{2}qe$

Q=C(V1-V2) (Standard formula Q = CV)

Here A=0 therefore C=0 and F=0

The intensity of force experienced is same when 15 and 16 enters the vicinity of electric field of 6 or 13, this time this force aids the motion of the belt, this the direction’s different. This fact can been utilized by absorbing the force which aids the motion of the belt and releasing it when this very same force acts against the motion of the belt, since this force is negligible, its recommended to overcome this force by the mechanism driving the belt.

See Figure – Explanation state 3

Diagrammatic explanation of the path traced by the electric field at state 2.

Figure –Explanation state 3

1

2

7

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6

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8

13

12

15

16

14

9

11

4

3

Since this section (8) of the belt is an insulator, it will let pass all electric field though it.

5 is a conducting plate which is grounded, so when 6’s electric field fall on it, due to laws of induction 5 gets induced by a net opposite charge with respect to 6.

This plate (6) has a permanent charge; it won’t change throughout the working of the machine.

Electric field produced by 6. The electric field produced by it will move towards 5 as 5 has 0 potential and 6 has a potential, so there is a potential difference which distracts the electric field.

Now continuing description after State 3 (The system is entering state 4) –

Figure – X/Y, state half 4, 6 LHS

1

2

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6

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8

13

12

14

15

16

9

11

4

3

3-d view of the system entering state 4 –

Figure – X/Y/Z, state half 4, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

As components 16 and 15 enter the vicinity of the electric field of plates 6 and 13 respectively, they are also grounded by 4 and 9 respectively (remember 16 and 15 are sections of the belt coated with a conductor towards the inner side), thus as components 16 and 15 enter further between 6 and 13 respectively, it acts as a sort of electric shield to 5 and 7 respectively (as 16 and 15 get induced by an equal and opposite charge with respect to 6 or 13, due to phenomenon of charge induction, all electric field produced by 6 and 13 gets terminated at 16 and 15); as a result the electric flux that 5 and 7 received from 6 and 13 reduces (flux does not become 0 as sections of 5 and 7 which have not been yet covered by 16 and 15 are still exposed to electric field produced by 6 and 13), thought the flux density remains the same. As 16 and 15 further move between 6, 5 and 7, 13; the total flux falling on 5 and 7 also reduces, due to this loss in flux a current continuously flows from 5 and 7 to earth as the total charge stored on each of the plates are reducing. This happens because initially; as explained in state 1; 5 and 7 are induced by a charge, this induced charge was being held by 6 and 13 until 16 and 15 moved between 6, 5 and 7, 13 respectively; ultimately releasing the grip of the electric field of 6 and 13 form 5 and 7. Now, since there is nothing to hold the charge on 5 and 7 it will flow to earth since 5 and 7 are earthed). This current is directly proportional to the velocity at which the 16 and 15 enter the vicinity of 6 and 13’s electric field as the higher the speed at which the belt rotates (i.e. higher the speed of 16 and 15 enter the vicinity of 6 and 13’s electric field) faster will be the discharge of 5 and 7, since 5 and 7 are discharging faster, the current flow will be higher. If the friction of the pulleys are ignored the belt can be moved with no force, in fact this motion will be aided and governed due the fact described earlier. The conclusion of this force is that if d is less this force can be neglected. It’s to be also noted that the current flowing from 5 and 7 to earth will be stable considering there are no fluctuations in the speed of the rotation of the belt. Since electric field is also acting on 16 and 15 it will now get induced by a charge and the flux falling on 16 and 15 will increase as it moves further between 6, 5 and 13, 7 (16 and 15 have a conducting layer on it, as said before). It can be said that the effects of this movement on 16, 15 and 5, 7 are inverse, 16, 15 gets charged while 5, 7 gets discharged. Also current will flow between earth and 16, 15 and will have opposite natures to that of the current flowing between earth and 5, 7 but the factor controlling the charge flow will be the same, that is directly proportional to the velocity of the belt; this current too is stable (flowing between 16 and 15 and earth) considering the belt has a constant velocity of movement (See Figure – Explanation state half 4).

Diagrammatic explanation of the path traced by the electric field during the transaction period of the machine from state 3 to 4.

Figure – Explanation state half 4

1

2

7

5

6

10

8

13

12

14

15

16

9

11

4

3

Since this section (8) of the belt is an insulator, it will let pass all electric field though it.

Since section 16 has a conducting layer on it, it will get induced by an equal and opposite charge to that of 6, since now it’ll be charged, it will distract some of the electric field from 6 to itself, allowing no electric field on some sections of 5 (the sections which have not been overlapped by 16).

This plate (6) has a permanent charge; it won’t change throughout the working of the machine.

5 is a conducting plate which is grounded, so when 6’s electric field fall on it, due to laws of induction 5 gets induced by a net opposite charge with respect to 6. In this case when not all Electric field from 6 fall on 5 (due to presence of 16), the net charge in this plate is less as compared to state 1. This charge will continue to reduce as the machine moves forward to state 2 (because 16, which is distracting some of the electric field towards it).

Electric field produced by 6. Some of the electric field produced by it will move towards 16 as 16 has 0 potential and 6 has a potential, so there is a potential difference which distracts the electric field. Now the electric field, in this case will show a preference for 16 (only for the sections of 5 which has been over lapped by 16), not 5 as 16 is in the way of 5 and has gained an equal and opposite charge due to laws of induction (Remember 16 is grounded by 4). 16 will act as an electric shield overall.

The electric field emitting from this section of 6 does not have 16 in its way, it has the insulator section of the belt in its way, which it gets passed through easily, thus the effects of 6’s electric field is prominent on some sections of 5 (sections which have not been overlapped by 16). As the belt will advance forward, this described section above will decrease in size as 16 will overlap it.

Due to this discharge of 5 (because the electric flux will decrease on 5 as 16 advances); since 5 is grounded, charge will flow from 5 to earth.

Now the system reaches state 4 –

View of the machine along X/Y axis with 6 in Left hand side and machine at state 4.

Figure – X/Y, state 4, 6 LHS

1

2

7

5

6

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8

13

12

15

16

14

9

11

4

3

View of the machine along X/Y axis with 13 in Left hand side and machine at state 4.

Figure – X/Y, state 4, 13 LHS

1

4

2

3

7

5

6

9

10

11

13

12

15

16

8

14

3-d view of the machine with 13 in Left hand side and machine at state 4.

Figure – X/Y/Z, state 4, 13 LHS

2

1

3

4

15

5

7

8

9

12

11

10

13

14

16

3-d view of the machine with 6 in Left hand side and machine at state 4.

Figure – X/Y/Z, state 4, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

Z/Y axis view of the machine facing 1 and 2 (or top view) at state 4.

Figure Z/Y, 1, 2 state 4

14

Z/Y axis view of the machine facing 12 and 10 (or bottom view) at state 4.

Figure Z/Y, 12, 10, state 4

8

Z/X axis view of the machinery facing 6 at state 4.

Figure Z/X, state 4, 6

6

8

16

14

Z/X axis view of the machinery facing 13 at state 4.

Figure Z/X, state 4, 13

8

14

13

15

Now consider the system has reached state 4, that is 16 and 15 are completely in between 6, 5 and 7, 13. At this point no electric field effects 5 and 7 as all the electric field has been distracted by 16 and 15, at this point the electric flux falling on 16 and 15 is maximum, as a result the forced experienced by 16, 6 and 13, 15 is maximum at this state (the same force also acts at state 2). This is the Columbian force of attraction. After this the system again goes to state 1 (see .

Diagrammatic explanation of the path traced by the electric field at state 4.

Figure – Explanation state 4

1

2

7

5

6

10

8

13

12

15

16

14

9

11

4

3

This plate (6) has a permanent charge; it won’t change throughout the working of the machine.

Since section 16 has a conducting layer on it and is grounded, it will get induced by an equal and opposite charge, since, now it’ll be charged, it will distract all the electric field from 6 to itself, allowing no electric field to fall on 5.

In this case when 5 experiences no electric field (as all electric field has been distracted towards 16) and is grounded, it has no net charge.

At this state, when all the electric field from 6 falls on 16 (as 16 is equal to the dimensions of 6) 16 has the maximum possible net charge (which is equal to its charge at state 4). Because of 16 is grounded, it will gain an equal and opposite charge as compared to 6, since its grounded it will allow no electric field to pass through itself, leaving 5 isolated form charge. Overall 16 acts as an electric shield to 5.

### Power generated by this arrangement –

Power can be harvested from the to and fro motion of the current, the power generated by the current (via the 3, 4, 9, 11) when 15, 16 moves away from between plate 6, 13 and 5, 7. This energy will be half the energy stored between the capacitor formed by plate 6, 13 and belt component 15, 16 in state 2 or 4 (see Figure – Capacitors).

Figure showing where will the capacitors be formed by 15 and 16.

Figure – Capacitors

1

2

7

5

6

10

8

13

12

14

15

16

9

11

4

3

15

6

Capacitor formed by 6 and 15

Capacitor formed by 16 and 13

13

16

Thus the energy generated by the time the machine enters State 2 or 4 will be -

Ens = (1/4)\*C\*(V1-V2)2 (Standard formula $E= \frac{1}{2}CV^{2}$)

Figure – X/Y/Z, state half 2, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

15 and 16 entering between 6, 5 and 7, 13 respectively

Since there are 2 such arrangements (15 and 16) (see Figure – Capacitors nos) the total energy considering this fact will now become

2Ens

Figure – Capacitors nos

1

2

7

5

6

10

8

13

12

14

15

16

9

11

4

3

15

6

Capacitor formed by 6 and 15

Capacitor formed by 16 and 13

13

16

There are 2 such arrangements

In one full cycle this will happen twice (state 2 and 4) –

Figure – X/Y/Z, state half 4, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

16 and 15 entering between 6, 5 and 7, 13 respectively

Thus total energy including this fact becomes 4Ens

The energy produced when 15, 16 come into vicinity of 6, 5 or 7, 13, will be the same(half the energy stored between the capacitor formed by plate 6, 13 and 15, 16 in state 2 or 4) though the direction of current will be opposite–

Ens

Figure – X/Y/Z, state half 3, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

15, 16 now leaving the area from between 6, 5 and 7, 13 respectively.

Since 2 such arrangements are present, this will be the total energy till now –

2 Ens

Since we are considering a cycle, this phenomenon will occur twice (Entering state 1 and 3) –

Figure – X/Y/Z, state half 1, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

16, 15 now leaving the area from between 6, 5 and 7, 13 respectively.

4Ens
Thus total energy generated by the to and fro motion of current between earth and 15, 16 –

8Ens

Power can also be harvested from the to and fro motion of the current between 5, 7 and earth which will be half of the energy stored between the plate of the capacitor formed by 6, 5 and 13, 7.

Figure showing where will the capacitors be formed by 5 and 7.

Figure – Capacitors 2 nos

1

2

7

5

6

10

8

13

12

14

15

16

9

11

4

3

Capacitor formed by 6 and 5

Capacitor formed by 13 and 7

This power will be –

Enbc = (1/4)\*(V1-V3)2\*C1 (Standard formula $E= \frac{1}{2}CV^{2}$)

First consider charge entering 5, 7 (state 1 and 3) –

Figure – X/Y/Z, state half 1, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

16, 15 now leaving the area from between 6, 5 and 7, 13 respectively, charging 7 and 5.

Figure – X/Y/Z, state half 3, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

15, 16 now leaving the area from between 6, 5 and 7, 13 respectively charging 5 and 7.

Since there are 2 such arrangements (see Figure – Capacitors 2 nos) present energy harvested will be –

2Enbc

Figure – Capacitors 2 nos

1

2

7

5

6

10

8

13

12

14

15

16

9

11

4

3

Capacitor formed by 6 and 5

There are 2 such arrangements

Capacitor formed by 13 and 7

Since we are considering a cycle, this phenomenon will occur twice (Entering state 1 and 3)

4Enbc

The scalar value of the current will be same when the system is entering state 2 and 4 (when charge is flowing from 5, 7 to earth), this too will occur twice in a cycle (4Enbc), thus total energy generated by the to and fro motion of current from earth and 5, 7 will be –

8Enbc

Figure – X/Y/Z, state half 4, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

16 and 15 entering between 6, 5 and 7, 13 respectively, discharging 5, 7

Figure – X/Y/Z, state half 2, 6 LHS

1

5

6

8

10

12

13

14

15

16

2

7

15 and 16 entering between 6, 5 and 7, 13 respectively discharging 7, 5

Total energy generated by the arrangement per cycle–

8(Enbc + Ens)

Analysis of the potential of this machinery in large scale electricity production –

**Variable value assumption and reasons –**

h – 5 meters – considering the machine needs not be portable, the only criteria will be that its cost of production should be less and energy produced per unit time and area should be more, therefore other than making many small units, making some big units is recommended, this will reduce the area occupied by parts which do not produced energy, the production cost and maintenance cost will too be reduced.

r – 1.5 cm or .015m – Though I have recommended the r to be largest possible, I have taken this value randomly since the current aim is to compute the machine’s potential, and r has no relation to it.

r1 - .015 m - Though I have recommended the r1 to be largest possible, I have taken this value randomly since the current aim is to compute the machine’s potential, and r has no relation to it.

n - .025 m– The size of the plates is inversely proportional to this value, thus it should be least possible, however too less of this distance can lead to rubbing of 7 and 5 with 10, 2 or 12, 1

d - .001 m– If this value is increased the power generated will too decrease and it will give rise to certain points in the working of the machine when the belt’s speed will increase or decrease by a limited value (as described earlier).

d1 – .01 m– This value has just been taken for convenience as the machine will be assumed to be working in vacuum whose break down voltage is of the order 107volts/cm.

v - 5\*106 volts– This value has been taken considering the system works in vacuum whose breakdown voltage is of the order 107v/cm and is also governed by the fact that d1 is 1 cm.

a – 4.42 m– This has been done to make 6, 13 and 5, 7 a square, this value is thus x/4, it’s not necessary to make this value as x/4, this is just an example.

b - .02 m – This value should be taken keeping in mind the economy in manufacture of the component, if it’s too small it will come out to be expensive alternatively if it’s too big, this will too be expensive.

RPM of belt – 20000 RPM – Considering the only challenge of the driving mechanism will be to just provide mechanical movement to the belt; this should not be an expensive task. However a perfect balance between the machine’s RPM and number of units should be made as to make the package economical.

|  |  |  |
| --- | --- | --- |
| Variable | Formulae used | Value (all distance quantities in meters) |
| h | Constant | 5 |
| r | Constant | .015 |
| r1 | Constant | .015 |
| n | Constant | .025 |
| x | $$4h-8r-8n$$ | 19.68 |
| j | $$\frac{x}{4}-2n-4r-πr$$ | 1.09287611 |
| w | $$\left(j+4r+2(d\_{1}-d)\right)$$ | 1.15487611 |
| d | Constant | .001 |
| d1 | Constant | .01 |
| v1 | Maximum potential difference on 6, 13 with respect to earth | 5\*106volts |
| v2 | Approximate | ~-5\*106volts |
| v3 | Approximate | ~5\*106volts |
| c1 | (ε0(x/4\*a))/d1 | $$2.14328012\*10^{-8}$$ |
| c | (ε0(x/4\*a))/(d1-d) | $$2.381422355\*10^{-8}$$ |
| a | Constant | 4.42 |
| b | Constant | .02 |
| Enbc | (1/4)\*(V1-V3)2\*C1 | 535820.03 joules |
| Ens | (1/4)\*C\*(V1-V2)2 | 595355.5888 joules |

Considering the above conditions the total energy produced per cycle will be –

8(Enbc + Ens)

= 9049404.95 joules

Calculating how many units will be required to power whole of US –

Considering the system works at 20000 RPM –

Energy produced the whole year at this rate –

9.512734483\*1016 joules

Or

26,424,262,450 KWh units

Energy consumed by the US in 2006 –

3,669,918,840,000,000Wh

Or

3,669,918,840,000kWh

Units required for producing this amount of energy –

~139 units which will require 3563.7167m3 volume

As seen from the above example of the machine it requires negligible input energy with respect to its output energy, also it does not require that much of maintenance. The density of energy production per unit area is too exceptionally high. Thus almost whole of the electricity bill that US gives can be converted to profit. Also attaining such amount of static charge is not a challenge.

Additional advices –

* Energy production can be increased by many times if a layer of dielectric medium is used on 6, 13, 7, 5, 15, 16 this will increase the breakdown voltage and the potential difference can be increased by many times
* Many such units can place in a building to further reduce the area required. If we consider a 2 story building with each floor having volume of 20\*20\*6, only 2 floors will be required to supply energy to the whole of US. Overall it can be said that the effective energy producing power plant is negligible in size.
* It’s recommended to distribute these units to different states, or suitable area so as to reduce the loss in energy due to transmission.
* It’s recommended to interconnect all the units such that it produces a near stable D/C current. This can be achieved by interconnecting all the machinery in such a way.
* Such high charges as assumed above can be produced easily using a van de Graff generator.
* The belt can be rotated by a power producing device like electric motor or engine. The driving mechanism needs to be made as per requirements (RPM vs power requirements).

Advantages over other technologies in this field –

* Energy production per unit area is negligible.
* Input cost in negligible.
* The systems can be over clocked to achieve peak demands, it has unlimited over clocking potential.
* Cost of maintenance is negligible.
* Flexible – can be used in verity of conditions.
* Hazards involved are less.
* Reliable – Can produce energy any time no matter how the climatic conditions are and is not dependent on natural resources.
* Speed of energy production is good.
* Does not cause any sort of pollution.
* Erection cost is less as compared to any large scale power producing plant of its order.



 Signatures of the inventor/representative