159 **WOUND STORAGE PACKAGE**
160.1 .Convolute coil (e.g., wound web)
160.2 ..Plural coils
160.3 ..Axial retainer (e.g., flange)
160.4 ..For particular coiled material
163 .Interconvolutionary strand delivery
164 .Strand end feature
165 ..Strand end forms winding
166 .Plural windings
167 ..Serially connected
168 .Distorted winding
169 ..Spooled
170 .Housing or outer peripheral support
171 ..With strand guide
172 .Strand restraining or snarl preventing means
173 ..Adhesive
174 .Particular winding
175 ..Cone wind
176 ..On core
177 ...Plain cone core
178 ...Plain cylinder
324 **UNWINDING AND REWINDING A MACHINE CONVERTIBLE INFORMATION CARRIER (E.G., MAGNETIC TAPE OR PHOTOGRAPHIC FILM)**
324.1 .Carrier helically or randomly wound (e.g., magnetic wire, edge wound film, etc.)
324.2 ..Cartridge storage
324.3 ..Carrier distributor
325 .Endless coiled carrier (i.e., closed loop)
325.1 ..Wound into superposed coil pair
325.2 ..Having carrier responsive control
325.3 ..Reversible
326 ..Cartridge storage
326.1 ...Insertion responsive component
326.2 ...Particular cartridge structure
326.3 ....Coil support
326.4 ....Carrier guide
327 ..Particular coil support
327.1 ...To accommodate convolution speed variations
327.2 ...Radial roller
327.3 ...Multiple pulleys or hub rollers
327.4 ....Cooperating pulley pair
328 .Unwinding from coil center
328.1 ..Radially shiftable hub component
328.2 ..Driven supply coil
329 .Winding into coil center
329.1 ..Having coil hub expander
330 .Simultaneously driven carriers (e.g., separate optic and sound webs)
331 .Intermediate storage (e.g., low inertia bin)
331.1 ..Vacuum column
331.2 ...Carrier responsive control
331.3 ....Pneumatic pressure controller
331.4 ....Photoelectric controller
331.5 ..Having spool or carrier brake control
332 .Including threading
332.1 ..Having particular automated control
332.2 ...Actuated by lead end sensor
332.3 ..Having pneumatic assist
332.4 ..Having leader gripper or coupling
332.5 ..Having rotary extractor (e.g., stripper)
332.6 ...Endless belt
332.7 ..Having carrier to spool attachment means
332.8 ...Slotted spool
333 .Automated stop or reverse
333.1 ..Diverse control signal inputs
333.2 ..Carrier supported signal
333.3 ..Carrier engaging tension sensor
333.4 ...Electrical control
333.5 ..Coil diameter sensor
333.6 ..Coil rotation sensor
333.7 ...Electrical control
334 .Carrier speed or tension control
334.1 ..Plural speeds
334.2 ..Diverse signal inputs
334.3 ...Tachometer-type signal device
334.4 ..Tachometer-type signal device
334.5 ..Coil diameter or weight responsive sensor
334.6 ..Carrier tension responsive signal
335 .Cartridge system (i.e., cartridge work station or cartridge)
336 ..Adaptive or convertible
337 ..Plural (i.e., multiple cartridges per work station)
337.1 ...Coil to coil

338 ..With insertion responsive component
338.1 ...Releasable brake
338.2 ....With shiftable cover actuator
338.3 ....Acting on plural coils
338.4 ...Cartridge positioner
339 ..Cartridge ejector
340 ..With particular drive mechanism
341 ..Coil-to-coil cartridge
342 ...With particular drive coupling
343 ...With brake or lock
343.1 ....Yieldable brake
343.2 .....Spool or coil engaging
344 ...With indicator or detector
345 ...With particular coil support
345.1 ....Coaxial coils
345.2 ....Spring pressed coil or spool
345.3 ....Coil on liner
346 ...With particular guide or guard
346.1 ....Shiftably mounted
346.2 ....Rotatable
347 ...With particular housing construction
347.1 ....Shiftable closure (e.g., door)
347.2 ....Separable or hinged sections
348 ..Single coil cartridge (e.g., film magazine)
348.1 ...With carrier inner end collector
348.2 ...With carrier outer end retainer
348.3 ...With means to facilitate unwinding
348.4 ...Light occludent
349 .With particular drive
350 ..Manual
351 ..Nonelectrical motor
352 ..Simultaneous drive to supply and take-up coils
352.1 ...Each drive a motor
352.2 ....With additional linear feed drive motor
352.3 ...Coil engaging drive
352.4 ....Endless belt
352.5 ...Multiple carrier speeds
353 ..With yieldable loop former
354 ..Particular linear feeder (e.g., capstan or sprocket)
354.1 ...Plural
354.2 ...With particular manual controller
355 ..With brake or stop
355.1 ...Radially applied
355.2 ....By manual operator
356 ..Alternately or differently driven coils
356.1 ...Coaxial coils
356.2 ...Step-driven coil
356.3 ...Multiple carrier speeds
356.4 ....With particular manual controller
356.5 ...By friction drive
356.6 ....With one-way clutch
356.7 ....Radially acting wheel, disk, or belt
357 .With detector or indicator (e.g., length scale)
358 .Particular frame or frame attachment
358.1 ..Including spool support
360 **LOOP FORMING (E.G., WINDING A BUNDLE OF WIRE COILS)**
361 .By orbital guide
361.1 ..Simultaneous or successive winding
361.2 ..About internal loop form
361.3 ...With loop discharge device
361.4 ..With loop collector
361.5 ...With loop bundle unloader
362 .By rotatably driven loop collector
362.1 ..Simultaneous or successive winding
362.2 ..With loop bundle unloader
362.3 ...Stripper plate or arm
363 .With particular loop or coil transfer mechanism
364 **UNIDIRECTIONAL WINDING AND UNWINDING**
364.1 .Convolute coil
364.11 .Partial wrap around plural rotatable supports
364.12 ..Shifting material axially
364.2 ..Distinct supporting surfaces on a support
364.3 ...With radial spacing regulator
364.4 .Threading
364.5 .Convertible between variable and fixed number of windings on material support
364.6 .Variable number of windings on support
364.7 ..Having material accumulation sensor

364.8 ...Senses without material contact
364.9 ..Rotating winding surface
365 ...Movable material displacement means (e.g., wobble plate)
365.1 ...Material removed axially from winding surface
365.2 ...Single material strand simultaneously wound into or unwound from plural coils
365.3 ..Stationary winding surface (e.g., with flyer)
365.4 ...Brake providing resistance to removal of material
365.5 ...Adjustable drum surface (e.g., variable diameter)
365.6 .Fixed number of windings on winding surface (e.g., positive feeder)
365.7 ..Automatic control or regulation of speed of winding surface
365.8 ..Manually adjustable winding surface speed
365.9 ..Manual drive
366 ..Winding drum details
366.1 ...Variable diameter
366.2 .Shifting material axially on support
366.3 .Distributing material along the support
366.4 .Particular drive
370 **REELING DEVICE**
223 .Fishing rod reel
224 ..Axial unwinding (i.e., spinning reel)
225 ...Motor driven
226 ....Spring motor
227 ...Spool rotatable to wind
228 ....With guide shiftable between wind and unwind positions
229 ....Spool pivotal between wind and unwind positions
230 ...With winding guide on rotor rearward of spool
231 ....Guide shiftable on rotor
232 .....Guide shifted to wind position by rotor drive
233 ......Guide shifted to unwind position by discrete manual operator
234 ...With winding guide on rotor forward of spool
235 ....Rotor drive shifts guide to unwind and wind positions
236 ....With manual actuator to shift guide to unwind position
237 .....Actuator forward of rotor
238 .....With line snubber shifted by remote actuator
239 ......Rotor and snubber shiftable axially
240 ....Guide shifted radially
241 ...With level-winding mechanism
242 ....Eccentric cam reciprocates spool
243 ...With brake
244 ....Continuously applied
245 .....Between spool shaft and frame
246 .....Between spool and spool shaft
247 ....Positive
248 .....Defines home position of reel part
249 ..With drive mechanism
250 ...Motor driven
251 ....Spring motor
252 .....Motor actuated in response to pull on line
253 .....With independent manual drive
254 .....With spring charger
255 ...Multiple drive ratio
256 ...Ratchet-type drive
257 ...With disengageable positive drive components (e.g., a clutch)
258 ....With alternative yieldable mechanism
259 ....Axially engaged
260 .....Coaxial of spool
261 ......Reengageable responsive to drive rotation
262 ....Reengageable responsive to drive rotation
263 ....Gear pair
264 ...With yieldable drive coupling (e.g., friction or fluid clutch)
265 ....Variable by crank manipulation
266 .....Variable within distinct range(s)
267 ....Between drive shaft and crank
268 ....Between drive shaft and gear
269 ....Coaxial with line take-up
270 .....Axially applied
271 ......By center pin
272 ...With feed roller

383 ...Material speed responsive (e.g., belt sensitive)
383.1 ....With lock prevention or sensitivity reduction
383.2 ....Inertia operator
383.3 .....Axially movable lock
383.4 .....Frame mounted locking pawl
383.5 .....Opposed pawls on spool
384 ...Frame movement responsive (e.g., vehicle sensitive)
384.1 ....With lock prevention or sensitivity reduction
384.2 ....With pivot pawl
384.3 ....Axially movable lock member
384.4 ....Multiply positionable operator
384.5 ....Pendulum operator
384.6 ....Ball operator
384.7 ...Manually operated
385 ..Lock against spool winding
385.1 ...Material movement responsive (e.g., window shade type)
385.2 ....With additional lock release
385.3 ....Movable locking pawl on frame
385.4 ...Manually operated
386 .With orbital wrapping guide
387 .Axial unwinding
388 .Multiple windings
388.1 ..Of centrally gripped material
388.2 ...With material snagging lock (e.g., midline tightener)
388.3 ....With unidirectional brake
388.4 ....With integrated crank
388.5 ...With mounting frame
388.6 ..Plural spools or spool portions
388.7 ...Alternatively driven
388.8 ....Single power source (e.g., clutched spools)
388.9 .Material stored in loops or variable-size coils
388.91 ..Plural coils
389 .With particular drive (e.g., ratchet drive, motor drive)
390 ..Motor powered
390.1 ...With material length stop
390.2 ...For unwinding
390.3 ....With coil constrainer
390.4 ...Weight
390.5 ...Fluid
390.6 ....With speed or torque control
390.7 ...Vehicle motor (e.g., power take-off)
390.8 ...Electric
390.9 ....With speed or torque control
391 ..Traction driven spool (e.g., ground engaging)
391.1 ...Spool shiftable clear of traction surface
391.2 ...With spool drive transmission
391.3 ....Belt or chain
392 ..Spool on vehicle wheel or axle
393 ..Peripherally driven spool
394 ..Releasable spool drive (e.g., clutched spool)
394.1 ...Limited torque (e.g., slip coupling)
395 ..Manually rotatable crank or wheel
395.1 ...Foldable spool drive crank
396 .With brake
396.1 ..Positive
396.2 ...One-way
396.3 ....Reversible
396.4 ....Ratchet and radial pawl
396.5 ..Friction
396.6 ...Applied to coil or spool (e.g., radial)
396.7 ....User pressure application
396.8 .....Radially applied
396.9 ....Axially applied
397 .With particular guide or guard
397.1 ..Guide boom or tube
397.2 ..Shiftably mounted guide (e.g., material distributor)
397.3 ...Driven shifting device (e.g., cam, crank, or screw)
397.4 ...Manually operated
397.5 ..Rotary guide
398 .With particular frame or frame carrier
399 ..Plural spool positions
399.1 ...With discrete actuator
399.2 ...Arcuately displaced positions
400 ..Combined with nonreel device
400.1 ...Hand wrapped
401 ..Collapsible or knockdown
402 ..With material segment retainer
403 ..Mobile carrier
403.1 ...Single primary axle (e.g., hand cart)
404 ..Releasable mounting (e.g., separable fastener)
404.1 ...Flexible strap or harness
404.2 ...Clamp (e.g., C-clamp)
404.3 ...Hook, ring, or hanger
405 ..Hand carried
405.1 ...Hand wrapped
405.2 ....With distinct handle

405.3 ...With distinct handle
406 ..With special base or mounting member (e.g., attachment socket or stake)
407 .With particular spool
407.1 ..Collapsible or knockdown
410 **TENSION CONTROL OR BRAKE**
411 .Cyclic material reserve (e.g., irregularly shaped take-up)
412 .Take-up coil drive control
412.1 ..With supply control
412.2 ...Plural condition sensors (e.g., slack loop sensors)
412.3 ....Diverse (e.g., slack loop and diameter sensors)
413 ..With material condition sensor
413.1 ...Plural sensors
413.2 ...Coil diameter responsive sensor
413.3 ...Slackness sensor (e.g., photocell or load cell)
413.4 ....With power control circuit
413.5 .....Electrical
413.6 ......Switch actuated
413.7 ....Transmission control
413.8 .....Yieldable drive (e.g., clutch or slip coupling)
413.9 ...Speed of running material sensor
414 ..Power control circuit (e.g., fluid regulating network)
414.1 ...Electrical circuit
415 ..Transmission control
415.1 ...Yieldable drive (e.g., clutch or slip coupling)
416 .Supply controlled
417 ..Reserve loop former
417.1 ...Pneumatic
417.2 ...Plural loops
417.3 ...Yieldable loop former
418 ..Feeder associated with coil
418.1 ...Slackness sensor
419 ..Drag on running material
419.1 ...Slackness sensor
419.2 ...Coil diameter sensor
419.3 ...Pneumatic or magnetic
419.4 ...Clamping
419.5 ....Rotary (e.g., pinch pair rollers)
419.6 ...Successive
419.7 ....Shiftable (e.g., variable tortuous course)
419.8 ...Rotary
419.9 ....With brake or clutch
420 ..Supply coil drive control
420.1 ...Peripheral drive
420.2 ....Belt
420.3 .....Slackness sensor
420.4 ...Clutch
420.5 ...Electrical control circuit
420.6 ....Slackness sensor
421 ..Supply coil brake control
421.1 ...Plural sensors
421.2 ...Coil diameter sensor
421.3 ...Coil weight sensor
421.4 ...Speed, torque, or revolutions sensor
421.5 ...Slackness sensor
421.6 ....With power control circuit
421.7 .....Electrical
421.8 ....Mechanically applied brake
421.9 .....Compound leverage mechanism
422 ..Yieldable coil brake
422.1 ...Plural
422.2 ...Fluid or magnetic brake or operator
422.3 ...Electrical operator
422.4 ...Radially applied
422.5 ....Wound material engaging
422.6 .....Strap
422.7 ......Accommodates roll transfer
422.8 ....Strap
422.9 ....Opposed
423 ...Axially applied
423.1 ....Coaxial with coil
423.2 .....Opposed
430 **COMPOSITE ARTICLE WINDING**
431 .Controlled by an electrical property of article
432 .On internally toothed core (e.g., motor stator)
432.1 ..By endless, flexible shuttle
432.2 ..By compound movement mechanism
432.3 ...Shuttle reciprocated
432.4 ....And oscillated
432.5 .....With radially shifted guide component
432.6 ..Having particular core holder or material guide
433 .On externally toothed core (e.g., motor armature)
433.1 ..By compound movement mechanism
433.2 ..By rotating core
433.3 ..By orbiting guide
433.4 ..Having particular core holder or material guide
434 .Through opening in ring-shaped core

434.1 ..By supply coil linked with core
434.2 ...Supply coil on rigid spool
434.3 ....Having material guide slidable on spool
434.4 ....Having guide ring coaxial with spool
434.5 ..By supply coil cycling through opening
434.6 ...Supply coil tangentially positioned on a winding shuttle
434.7 ..By material end cycling through opening
434.8 ...Multistep cycle
434.9 ..Having particular core holder or indexing means
435 .On spherical core
435.1 ..Core peripherally driven to wind
435.2 ...By roller
436 .Modified spherical core or article
437 .On irregularly shaped core
437.1 ..Having curvilinear or offset core portions
437.2 ...Diverse coils
437.3 ..Noncircular core
437.4 ...Flattened core
438 .For prestressing core
438.1 ..By orbiting material supply
439 .By orbiting material supply
439.1 ..Material guide disposed about core tip (e.g., terminal winder)
439.2 ...Motor powered
439.3 ....Handheld
439.4 ..Simultaneous winding
439.5 ...On single core
439.6 ....Supply coil coaxial with core
440 ..Sequential winding
440.1 ...On single core
441 ..Having mechanism to distribute convolutions
441.1 ...Reciprocating
441.2 ...Single winding pass
441.3 ....Core supports winder
441.4 ....Material supply coaxial with core
442 ..Handheld wrapping tool
443 .By rotating core
443.1 ..Simultaneous winding
444 ...On single core
444.1 ....Dielectric and conductive layers (e.g., capacitor)
444.2 .....Special web layering (e.g., offset edges)
444.3 .....Continuous or semicontinuous winding
444.4 .....Adjacent helical layers (e.g., strand on strand)
444.5 .....Web layer wound between helical layers
445 ..Sequential winding
445.1 ...On single core
446 ..Having manual drive
447 ..Having mechanism for distributing convolutions
447.1 ...By reciprocating guide or supply
447.2 ....Threaded operator
447.3 ...Single winding pass
448 .Having particular workpiece holder
448.1 ..Core flexure inhibiter (e.g., for winding onto hose)
470 **HELICAL OR RANDOM WINDING OF MATERIAL**
471 .For web material
472 .On a hand tool (e.g., tatting shuttle or heddle needle)
472.1 .Untwisted fiber bundle (i.e., sliver)
472.2 ..Particular traverse of bundle
472.3 .Of twine mass or ball
472.4 ..By orbital flyer
472.5 .To form coreless package
472.6 .By orbital flyer
472.7 .On planar form (e.g., card, board)
472.8 .Plural distinct strands onto single spool (e.g., doubling machine)
472.9 ..Having material controlled stop
473 ...Break or exhaust responsive
473.1 ....Separating wound package from driver engaging package periphery
473.2 ...Coil diameter responsive
473.3 ....Separating wound package from driver engaging package periphery
473.4 .Including wound package or empty spool handling
473.5 ..Removing wound package from or loading empty spool onto a winding station
473.6 ...Carriage-mounted handling device

473.7 ....Including additional material manipulation
473.8 ...Including additional material manipulation
473.9 ...By ejector
474 ..Loading supply package on or removing empty spool from unwinding station
474.1 ...On a tray with vertical spool support
474.2 ...Including additional material manipulation
474.3 .Alternately or sequentially wound spools
474.4 ..Spools on parallel spindles
474.5 ...Spindles on indexable turret
474.6 ....Coil engaging drive (i.e., peripheral drive)
474.7 ...Including particular material snagger
474.8 ..Coaxial spools
474.9 ...On separately driven spindles
475 ....Including particular material snagger
475.1 .Joining ends of material (e.g., knotting, splicing)
475.2 ..On carriage movable between plural winding stations
475.3 ..Plural winding stations movable to fixed position joining means
475.4 ..Including particular joining structure or control
475.5 ..Including inspection or detection of material ends or of joined ends
475.6 ..Including particular material end transfer to joining means
475.7 .Including positioning of material outer end on wound package
475.8 ..Including outer end and removal and repositioning on package
475.9 ...Inserting material end within package
476 .Material outer end removed from package
476.1 .Including particular material to spool connection
476.2 ..By separate preliminary wind
476.3 ...Preliminary wind overwraps material end
476.4 ...Prior to material introduction to traverse guide
476.5 ....Including particular material end gripper
476.6 ..Including particular material end gripper
476.7 .Distributing material along the package
476.8 ..High frequency, low amplitude traverse superposed on low frequency high amplitude traverse
476.9 ..Rotating take-up having radially movable guide
477 ...Material guide pressed against wound package
477.1 ..Preventing package end ridge
477.2 ...By shifting the traversing stroke of guide
477.3 ...By varying the traversing speed of guide
477.4 ..Preventing superposed convolutions in successively wound layers (i.e., ribbon breaker)
477.5 ...By control of guide
477.6 ....Guide traverse speed
477.7 ...By control of take-up
477.8 ....Take-up rotational speed
477.9 ..Traverse speed dependent on direction of motion
478 ..Forming symmetrical layer
478.1 ..Stepwise (i.e., orthocyclic)
478.2 ..With distribution monitor and correction or indication
478.3 ..By relatively reciprocating ring rail having an orbital guide
478.4 ...Long traverse stroke (e.g., wrap wind)
478.5 ....Guide stroke limit shifted along package
478.6 ...Short traverse stroke shifted along package (e.g., weft wind)
478.7 ....Including forming an initial reserve coil
478.8 .....By control of traverse
478.9 ......By use of auxiliary cam
479 ......Including varying rate of shifting of stroke limits
479.1 ......Including varying of stroke length
479.2 ..By progressive shifting of constant traverse stroke
479.3 ...Long traverse stroke (e.g., bobbin tapered at both ends)

479.4 ....On bobbin having cylindrical and frusto-conical portions
479.5 ...Short traverse stroke
479.6 ....Guide stroke moves progressively along axially stationary package
479.7 .....Having progression roller engaging package periphery
479.8 ....Including formation of an initial reserve coil
479.9 ....Including material controlled stop
480 .....Break or exhaust responsive
480.1 .....Wound material sensor
480.2 ....Forming plural wound packages
480.3 ....Including particular presser or shaper for package as it is wound
480.4 ..Progressive variation of guide stroke length (e.g., at least one end of package tapered)
480.5 ...By lever guided in inclined rail
480.6 ...By lever having variable pivot
480.7 ...On double-headed spool
480.8 ..Manually adjustable traverse
480.9 ..Servo-driven guide following moving pattern
481 ..Using fluid (fluid motor or direct fluid action)
481.1 ...By pneumatic jet distributor
481.2 ..Using magnetic device
481.3 ..Endless loop mechanism
481.4 ...Single guide on endless loop
481.5 ....Guide strikes material from opposite sides
481.6 ...Counter moving guides (e.g., pins) striking material
481.7 ..Counter moving guides (e.g., pins) striking material
481.8 ..By cam engaging material
481.9 ...Cam is grooved material-receiving spool
482 ...Including auxiliary structure for guiding material across cam groove intersection
482.1 ...Including auxiliary structure for preventing material from moving beyond ends of grooved cam
482.2 ...Wear-resistant groove structure
482.3 ...Split drum
482.4 ..Guide driven by cam and follower
482.5 ...Rotatable guide following stationary cam (e.g., guide on nut on threaded shaft)
482.6 ...Driven by cam-contacting lever
482.7 ....Adjustable throw lever
482.8 ...Rotary cam and linearly shifted follower
482.9 ....Threaded cam
483 .....Grooved spool and follower
483.1 .....Threaded cams with split nut cam followers
483.2 ......Having electrical switching device
483.3 .....Having reversible cam drive
483.4 ......Alternately engageable drives (e.g., alternately operated clutches)
483.5 .....Reversely threaded (i.e., cam having opposite threads)
483.6 ......Having irregularly threaded portion (e.g., forming tapered package)
483.7 ....Details of follower
483.8 ..Guide driven by rotating crank or eccentric
483.9 ..Guide on driven oscillating lever
484 ..By shifting spool
484.1 ...Cam shifting mechanism
484.2 ..Self traversing (i.e., guide moved by material)
484.3 ...Toggling guide bar
484.4 ...Follower engaging wound material
484.5 ..Traverse drive motor mounted on guide
484.6 .Including particular drive
484.7 ..Associated with sewing machine drive for forming wound package for sewing machine shuttle
484.8 ...Having material controlled stop
484.9 ..Having winding state-controlled stop
485 ...Running material sensor
485.1 ....Having take-up package sensor
485.2 ....Break or exhaust responsive (absence of material)
485.3 .....Separating wound package from peripheral drive drum or roll
485.4 ....Thickness variation responsive
485.5 ....Material length responsive

485.6 ...Wound material sensor
485.7 ....Coil (package) diameter responsive
485.8 .....Separating wound package from peripheral drive drum or roll
485.9 ..Peripheral drive
486 ...And driven spindle
486.1 ...Including details of take-up-contacting drive
486.2 ...Particular holder or support for spool or wound package
486.3 ...Including speed control
486.4 ...Including drive pressure regulator
486.5 ...Manual
486.6 ..Particular drive motor or motor structure
486.7 ..Including speed control
486.8 ..Drive engages spindle
486.9 ...Manual
487 ..Manual
487.1 .And severing
487.2 ..Tension variation responsive
487.3 ..Material defect responsive
487.4 ..Coil diameter responsive
487.5 ..Material length responsive
487.6 ..Severing proximate to spool
487.7 ..Particular severing device
487.8 ...Bladeless
487.9 ...Multiple blades
488 ...Blade and coacting anvil
520 **CONVOLUTE WINDING OF MATERIAL**
521 .With tearing or breaking
522 .With cutting, perforating, or notching
523 ..Automated control
523.1 ...For transverse cutting
524 ..Sequential cutting stations
524.1 ...Longitudinal and transverse severing
525 ..Longitudinal cutting
525.1 ...Positionally related slitter and winding surface
525.2 ....Slitter engages winding surface
525.3 ...Includes nonwound strip (e.g., trimming)
525.4 ...Perforating
525.5 ...With particular slitter adjustment
525.6 ...By rotary slitter disk
525.7 ....With reactive material support surface
526 ..Transverse cutting
526.1 ...Perforating or notching
526.2 ...With winding of flexible cutter
526.3 ...Special end forming (e.g., tapering)
527 ...Knife shiftable to sever material
527.1 ....Within roller
527.2 ....Cut adjacent to new core
527.3 .....Arcuately shiftable cutter
527.4 ......With anvil or cooperating cutter
527.5 ....Edge-to-edge (e.g., scissor type)
527.6 .....Rotary disk
527.7 .....With reactive surface (e.g., anvil)
528 .Of discrete sheets or articles
529 .Contracting or expanding spool during winding
530 .Simultaneous winding
530.1 ..Coaxial coils
530.2 ...Superposed coils
530.3 ...Relatively rotatable coils
530.4 ...Multiple coil groups
531 .Sequential winding stations
531.1 ..With transitional guide
532 .With particular material connection to take-up
532.1 ..To take-up leader
532.2 ..Pneumatic assist
532.3 ..Bonded (e.g., adhesive or water)
532.4 ..Material pierced by take-up component
532.5 ..Clamp on take-up
532.6 ..Slotted take-up
532.7 ..With particular threading facility
533 .With spool loading or coil removal
533.1 ..With particular spool supply hopper
533.2 ..Pivotal transfer device
533.3 ...Peripheral coil support
533.4 ...Turret
533.5 ....With particular turret indexer
533.6 ....With particular winding drive
533.7 ..Axially shifted transfer device
533.8 ..Mobile carrier (e.g., wheeled vehicle)

534 .Detector, control, or material responsive stop
534.1 ..Responsive to material path
534.2 ..Responsive to material length
535 .With feeder
535.1 ..Deflecting material into coil (e.g., coreless coiling)
535.2 ..Variable or intermittent
535.3 ..Driven with take-up or supply
535.4 ..Endless belt or chain
535.5 ..Special surface (e.g., toothed)
536 .Winding spaced-apart convolutions
537 .Irregularly shaped take-up
538 .With coiled supply
538.1 ..Coordinated drive of supply and take-up coils
538.2 ..With intermediate access station
538.3 ...Enclosed housing for coils
538.4 ..Light occludent construction (e.g., light sensitive film holder)
539 .With particular frame
540 .With particular drive
541 ..Driver engages coil periphery
541.1 ...With spindle driver
541.2 ...Coreless
541.3 ...Endless belt driver
541.4 ...With drive pressure regulator (e.g., nip pressure control)
541.5 ....Coil engaging pressure element
541.6 .....Fluid actuator
541.7 ....Fluid actuator
542 ...Plural drums
542.1 ....Driven at different speeds
542.2 ....Shiftable drum
542.3 ...With core steering means (e.g., pivotal mounting or guide rail)
542.4 ...Particular drum
543 ..Intermittent
544 ..Variable speed
545 ..With clutch or releasable coupling
545.1 ...Limited torque
546 ..With particular drive input
546.1 ...Manual
547 .Pressure element against coil (e.g., nip pressure member)
548 .With particular material guide or guard
548.1 ..Distributing
548.2 ..Edge of running web
548.3 ..Proximate coil end
548.4 ...Noncontacting (e.g., magnetic or air)

550 **UNWINDING**

551 .With attachment to preceding material
552 ..With accumulator
553 ..With lead end modification (e.g., trimming)
554 ..With automated control
554.1 ...Material registration
554.2 ...Cutting
554.3 ...Turret indexing control
554.4 ...Differentiated material portion (e.g., material end, tear, or signal)
554.5 ...Drive or brake control
554.6 ....Speed matching (e.g., new roll to running material)
555 ..Splicing running material (i.e., flying splice)
555.1 ...Shift new material
555.2 ....Longitudinal shift
555.3 ...Between new roll and expiring material
555.4 ....Stationary roll positions
555.5 ....Turret support for new roll
555.6 .....With particular splicer
555.7 .....With peripheral drive
556 ..With particular splice means (e.g., glue or pressure)
556.1 ...Adhesive tape
557 .Mobile unwinding station (e.g., wheeled conveyance)
558 .With supply coil replenishment
559 ..Supply coil transfer apparatus
559.1 ...Arcuate transfer path
559.2 ....By indexed turret
559.3 ...Sequential coil shifting
559.4 ...Coil vertically positioned
560 ..Reserve coil storage
560.1 ...With feeder from subsequent supply
560.2 ...Manually shifted reserve coil
560.3 ....Radially shifted
561 ..Static ramp or track
562 .With material end separator (e.g., doctor blade or jet)
562.1 ..With threading along unwinding path
563 .With detector, indicator, or control

563.1 ..Unwinding path (e.g., material alignment)
563.2 ..Material length
564 .With drive mechanism
564.1 ..Limited interval
564.2 ...Manual crank or lever
564.3 ..Feeder spaced from coil
564.4 ...Roller or sprocket
564.5 ..Coil engaging driver
565 .With unwinding limit
566 .With particular guide or guard
570 **COIL HOLDER OR SUPPORT (E.G., SPINDLE, DISPENSER, OR SPOOL)**
571 .Radially expansible or contractile
571.1 ..Inflatable bladder
571.2 ...Plural
571.3 ..Spool loading responsive
571.4 ...Compressible or deflectable
571.5 ....Longitudinal rib
571.6 ..Rotation responsive
571.7 ...Wedging roller or ball
571.8 ..Axially compressed elastic mass
572 ..Longitudinally shiftable operator
573 ...Cam and follower
573.1 ....Surface wedge
573.2 ....Longitudinally spaced cams
573.3 .....Opposed
573.4 ......Separable (i.e., opposed stubs)
573.5 ......Threaded operator
573.6 ....Reverse thread helices
573.7 .....Free end spindle
573.8 .....Radial wedge separates mandrel segments
573.9 ....Free end spindle
574 ...Shiftable linkage
574.1 ....Parallelogram
574.2 ....Mutually pivoted (e.g., lazy tong type)
574.3 ....Trapezoidal
574.4 ....Center actuated, pivoted linkage (e.g., umbrella type)
575 ..Transversely shiftable operator
575.1 ...Split band spreader
575.2 ...Geared segment
575.3 ...Rotatable cam or cam follower
575.4 ....Hinged mandrel segment
575.5 ...Shiftable linkage
576 ..With particular actuator or contractor
576.1 ...Fluid
577 ..Individually adjustable segment or spoke
577.1 ...Yieldable
577.2 ...Variable spoke alignments
577.3 ...Bodily retractable spoke
577.4 ...Linearly shiftable winding surface
578 .Axially adjustable
578.1 ..Threaded operator
578.2 ..Discrete adjustment positions
578.3 ..Yieldable coil support
579 .With material end retainer
580 ..Outer end
580.1 ...Edge grip or barrier pair for strip material
581 ..With attractor (e.g., magnet or vacuum)
582 ..Preattached flexible leader
583 ..Adhesive or hook-and-pile fabric
584 ..Material penetrating (e.g., piercing)
584.1 ...Projection for preformed material opening
585 ..Edge grip pair for strip material
586 ..Clamp
586.1 ...Threaded or cam operator
586.2 ...Separable from coil holder
586.3 ...Bodily displaced
586.4 ...Pivoted
586.5 ....About winding or parallel axis
586.6 .....Resilient
587 ..Apertured
587.1 ...Coacting with material fitting or modification
587.2 ...Slot
587.3 ....With special access
588 .Randomly oriented coil holder (e.g., portable)
588.1 ..With hand or body attachment
588.2 ..With distinct hand grip
588.3 ..Dispensing container
588.4 ...Unitary folded blank
588.5 ...Light occludent construction
588.6 ...With coil supporting hub
590 .Mounted coil holder or spindle (e.g., dispenser or mandrel)
591 ..Discrete coil positions
592 ..Infinitely variable coil positions
593 ..Axial material delivery

613 ..Particular hub or core formation
613.1 ...Irregularly shaped (e.g., tapered)
613.2 ....Cross sectionally
613.3 .....Flattened (e.g., card)
613.4 ...Reinforcement feature
613.5 ....Flangeless core
614 ..Flange feature
614.1 ...Reinforcement
615 **MATERIAL GUIDE OR GUARD**
615.1 .Variable guide path
615.11 .Fluid suspension
615.12 ..Turning guide
615.2 .Rotatable
615.21 .Angled turning guide for a web
615.3 .With material confining portion
615.4 .With particular guide surface formation or treatment
118 **BOBBIN OR SPOOL**
118.1 .Open-work structure
118.11 ..Resilient
118.2 .Resilient
118.3 .Cop-tube type (i.e., headless or single-headed tube)
118.31 ..Reinforcing feature
118.32 ..Tube material feature
118.4 .Double-headed spool
118.41 ..Plural spools axially connected
118.5 ..Head(s) adjustable along axis
118.6 ..Head connections (e.g., bolted)
118.61 ...Inserted head joint
118.62 ....Screw connection(s)
118.7 ..Spool material feature
118.8 ...Sheet stock
125 .Thread fastener or guide
125.1 ..Strand end attacher
125.2 ...Outer end
125.3 ....Permits unwinding
127 **SKEIN HOLDER**
128 **STRAND UNWINDING DEVICE**
129 **HOLDER FOR COILED STRAND**
129.1 **STRAND TAKE-UP DEVICE**
129.2 .Lever type
129.3 .Rewind type
129.4 .Counterweight type
129.5 **SUPPORT FOR A STRAND MATERIAL HOLDER**
129.51 .Opposed stub-shafts
129.53 ..With guide(s)
129.6 .Shaft supported at both ends
129.62 ..With guide(s)
129.7 .With axial-position retainer for holder
129.71 ..With retainer-spindle
129.72 ..With guide(s)
129.8 .With brake for holder and/or strand
130 .For bobbins (i.e., commercial-type strand packages)
130.1 ..With spindle modified for conical bobbin
130.2 ..Vertically suspended spindle
130.3 ..Pinboard (i.e., bobbin-storage tray)
130.4 ..Skewer
131 ..Creel
131.1 ...Warp type
132 ..Receptacle or trough
134 .For a spool (i.e., domestic-type strand package)
136 ..Carrier attachment
137 ..Receptacle
137.1 ...With guide eye
138 ...Single spool
139 ..Stand
140 ..Thread guard or guide
141 .For twine
146 ..Receptacle
147 R **STRAND TENSIONING DEVICE**
147 A .Air
147 M .Magnet
148 .Alarm or indicator
149 .Clamp
150 R ..Disk type
150 M ...Magnetic
151 ..Roller
152 ...Fluted
152.1 ..Ball
153 .Tortuous course
154 ..Adjustable
155 R .Wheel or pulley
155 M ..Magnetic
155 BW ..Bull wheel
156 .Brake
156.1 ..Peripheral, on material itself
156.2 ..Automatic, on disc other than spool
157 R **STRAND GUIDE**
157.1 .Oscillatable or reciprocable
157 C .Pig tail
222 **CARD, BOARD, OR FORM**
899 **MISCELLANEOUS**

CROSS-REFERENCE ART COLLECTIONS

900 **PARTICULAR APPARATUS MATERIAL**
901 **FIGURE EIGHT WINDING**
902 **LINE LOADER FOR FISHING REEL**
903 **DRUM FOR A WINCH OR HOIST**
904 **WATER SKI REEL**
905 **WINDER WITH STORAGE CHAMBER (E.G., FOR DEODORANT, PAPER, ETC.)**
906 **STATIC CHARGER OR DISCHARGER**
907 **VIBRATION CREATION OR DAMPENING**
908 **FLUID TREATMENT OR HANDLING**
909 **HEATING OR COOLING**
910 **CONVOLUTION TIGHTENER OR LOOSENER**
911 **CUTTER**
912 **INDICATOR OR ALARM**
913 **SAFETY DEVICE**
914 **SPECIAL BEARING OR LUBRICATION**
915 **COIL GRIPPER**
916 **HAND TOOL**
917 **ACCOMODATING SPECIAL MATERIAL OR ARTICLE (E.G., ANTENNA)**
918 .Web material (e.g., thermal insulation)
919 ..Ground cover (e.g., tarp)
920 **GLASS STRAND WINDING**

FOREIGN ART COLLECTIONS

FOR 000 **CLASS-RELATED FOREIGN DOCUMENTS**

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

FOR 100 **SPOOLER (242/16)**
FOR 101 .Multiple (242/17)
FOR 102 **BOBBIN OR COP WINDING (242/18 R)**
FOR 103 .Ribbon breaker (i.e., means to prevent coil crowding) (242/18.1)
FOR 104 .Cutting device (242/19)
FOR 105 .Sewing machine shuttle (242/20)
FOR 106 ..Cutting device (242/21)
FOR 107 ..Stop (242/22)
FOR 108 ..Disk type (242/23)
FOR 109 ..Thread presser or pad (242/24)
FOR 110 .Wire (242/25 R)
FOR 111 ..Alternate or successive wind (242/25 A)
FOR 112 .Symmetrical layers (242/26)
FOR 113 .Building mechanism (e.g., ring-rail type) (242/26.1)
FOR 114 ..Wrap wind (i.e., full-traverse mechanism) (242/26.2)
FOR 115 ...Means to vary traverse mechanism (242/26.3)
FOR 116 ..Weft wind (i.e., short-traverse mechanism) (242/26.4)
FOR 117 ...Preliminary or bunch winders (242/26.41)
FOR 118 ....By auxiliary cam means (242/26.42)
FOR 119 ....By traverse controlling means (242/26.43)
FOR 120 .....With means to control gain mechanism (242/26.44)
FOR 121 ...Means to vary service traverse or gain (242/26.45)
FOR 122 .Full traverse mechanism shifted in one direction (242/26.5)
FOR 123 .Cone wind (242/27)
FOR 124 ..Preliminary or bunch winder (242/27.1)
FOR 125 ..detector or stop (242/28)
FOR 126 ...Thread break or exhaust (242/29)
FOR 127 ...Load (242/30)
FOR 128 ..Quick traverse (242/31)
FOR 129 ..Multiple (242/32)
FOR 130 ..Presser or shaper (242/34)
FOR 131 ..Spindle or appurtenance (242/35)
FOR 132 .Multiple (242/35.5 R)
FOR 133 ..Removing full and supplying empty bobbins (242/35.5 A)
FOR 134 ..Turret type (242/35.5 T)
FOR 135 .Reserve thread uniting (242/35.6 R)
FOR 136 ..End finder (242/35.6 E)
FOR 137 .Detector or stop (242/36)
FOR 138 ..Thread break or exhaust (242/37 R)
FOR 139 ...Knotter (242/37 A)
FOR 140 ...Doubling machine (242/38)
FOR 141 ..Load (242/39)
FOR 142 ...Doubling machine (242/40)
FOR 143 .Ejector (242/41)
FOR 144 .Doubling machine (242/42)
FOR 145 .Quick traverse (242/43 R)

FOR 146 ..By means to vary traverse mechanism (242/43.1)
FOR 147 ..By drum guide means (242/43.2)
FOR 148 ..Counter rotating fingers (242/43 A)
FOR 149 ..Air jet (242/43 B)
FOR 150 ..Magnetic (242/43 M)
FOR 151 .Spool or bobbin lifter (242/46)
FOR 152 .Driving connection (242/46.2)
FOR 153 ..Modified bobbin or cop (242/46.21)
FOR 154 ..Cop tube (242/46.3)
FOR 155 ..Clutch (242/46.4)
FOR 156 ...Centrifugal (242/46.5)
FOR 157 ..Resilient head (242/46.6)
FOR 158 ..Resilient socket (242/46.7)
FOR 159 ...Coil spring (242/46.8)
FOR 160 .Alternate, successive dual wind (242/18 A)
FOR 161 .Anti-bounce (242/18 B)
FOR 162 .Glass winding (242/18 G)
FOR 163 .Change speed (242/18 CS)
FOR 164 .Air actuation (242/18 AA)
FOR 165 .Drum drive (242/18 DD)
FOR 166 .End wind (242/18 EW)
FOR 167 .Preliminary wind (242/18 PW)
FOR 168 **CORDAGE (242/47)**
FOR 169 .Unidirectionally moving coils (242/47.01)
FOR 170 ..With seal for coil support means (242/47.02)
FOR 171 ..With threading means (242/47.03)
FOR 172 ..Interdigitated composite rotating surface (242/47.04)
FOR 173 ...Rigid cages (242/47.05)
FOR 174 ...Elements pivot on axis parallel to rotating axis (242/47.06)
FOR 175 ...Independent radially moving elements (242/47.07)
FOR 176 ..Plural drums (242/47.08)
FOR 177 ...Single run contacting (242/47.09)
FOR 178 ....Planetating (242/47.1)
FOR 179 .....Helically grooved drum (242/47.11)
FOR 180 ..With lateral material-traverser (242/47.12)
FOR 181 ...Axially moving element (242/47.13)
FOR 182 .Storage on sheaves (242/47.5)
FOR 183 .Cutting device (242/48)
FOR 184 .Detector (242/49)
FOR 185 .Card, board, or form (242/50)
FOR 186 .Heddle or seine needle (242/51)
FOR 187 .Tatting shuttle (242/52)
FOR 188 .Hank or skein winnding (242/53)
FOR 189 **TRAVERSE MECHANISM (242/158 R)**
FOR 190 .Eccentric or crank (242/158.1)
FOR 191 .Screw shaft (242/158.2)
FOR 192 ..Reversely threaded (242/158.3)
FOR 193 .Reversing mechanism (242/158.4 R)
FOR 194 ..Split nut alternately engaging left and right hand screw threads (242/158.4 A)
FOR 195 .Cam (242/158.5)
FOR 196 .Belt chain traverse (242/158 B)
FOR 197 .Air (242/158 F)

DIGESTS

DIG 1 **TAPE PROGRAM CONTROL MEANS**
DIG 2 **NARROW FABRIC WINDING APPARATUS**
DIG 3 **CORELESS COILERS**