

Sept. 1, 1953

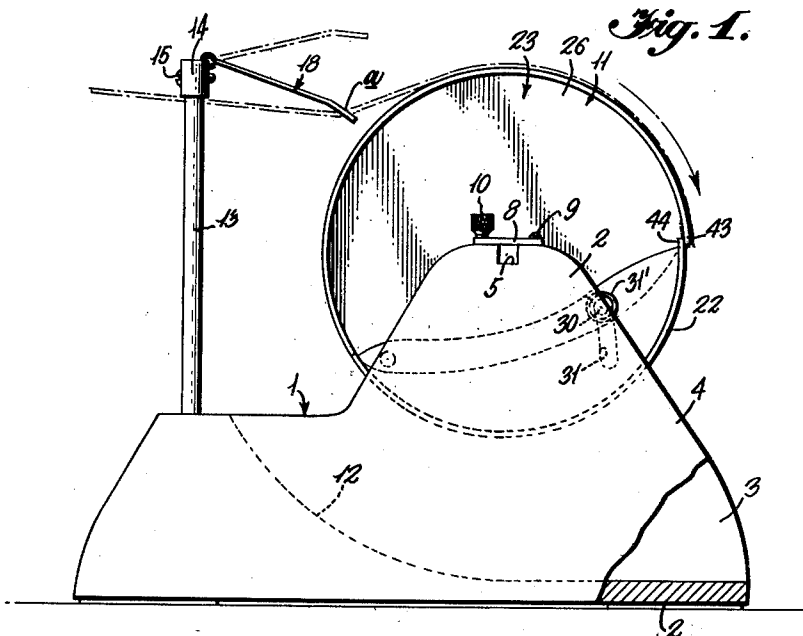
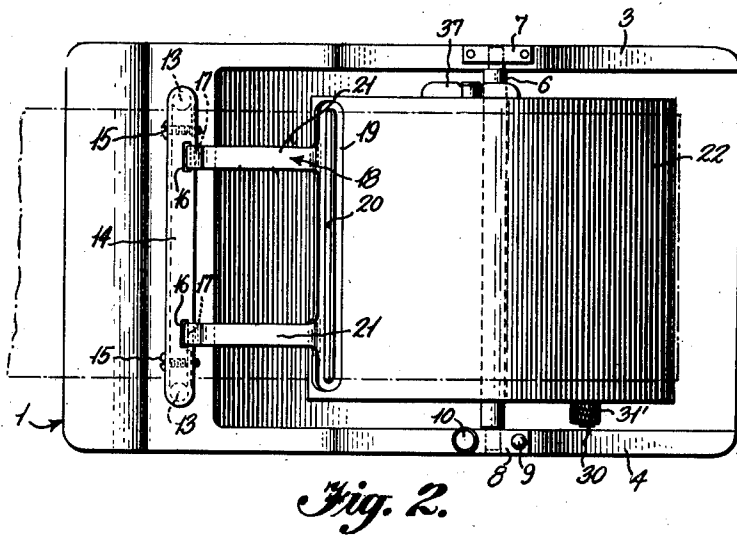
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2,650,775

PORTABLE REWINDER FOR PAPER TAPE FROM BUSINESS MACHINES

Filed April 22, 1952

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

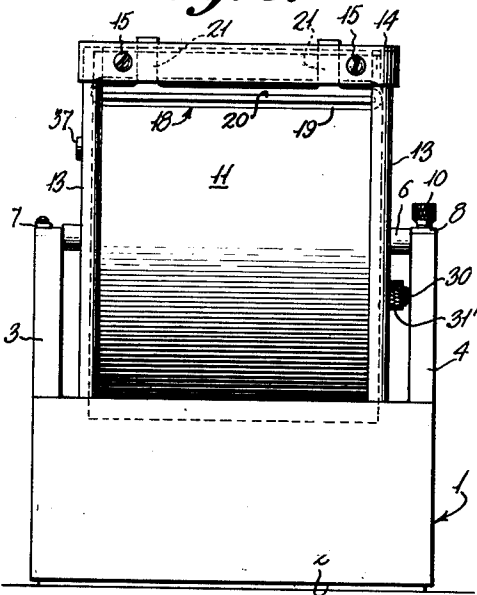


Fig. 4.

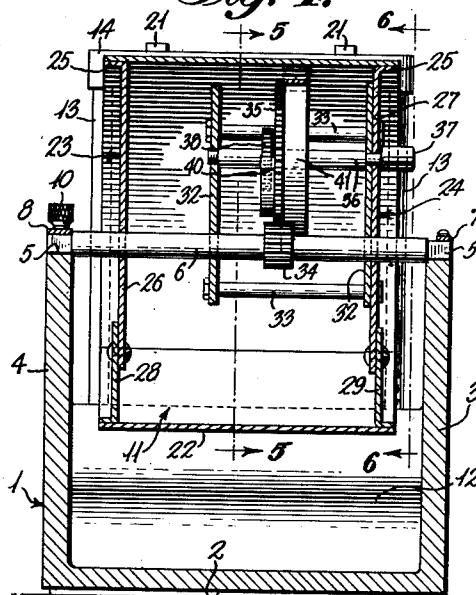


Fig. 5.

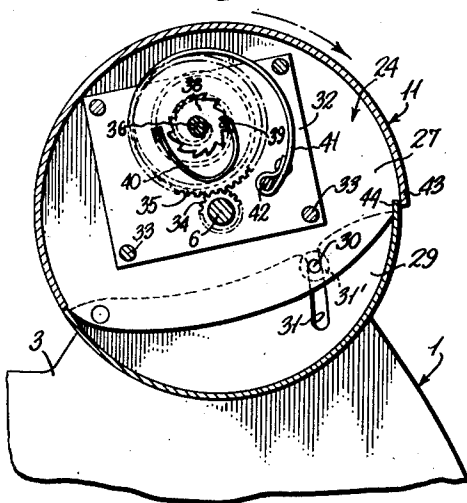
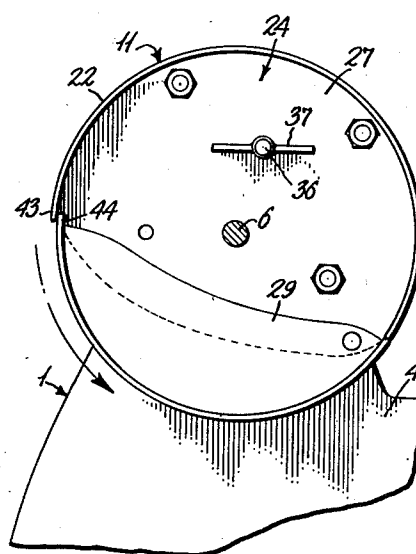


Fig. 6.



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PORTABLE REWINDER FOR PAPER TAPE
FROM BUSINESS MACHINES

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7 Claims. (Cl. 242-74)

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This invention relates to a portable rewinder especially adapted, although not exclusively designed, for winding the paper tape that exhausts from various types of business machines during a day's operation, which in present practice is ordinarily allowed to collect on the floor or in a basket, from which it must be recovered at the end of the day by a clerk who has to untangle and roll the tape which has frequently become torn and dirty.

One of the objects of the present invention is to provide an automatic rewinding drum to be positioned adjacent the business machine, to which the end of the record tape is attachable, and which exerts a continuous tension upon the tape so that it is wound in a neat roll on the periphery of the drum as it is released from the business machine.

Another object of the invention is the provision of a drum for the purpose described, formed as a casing which completely encloses the impelling mechanism, and is formed in two segments hingedly connected at one side and normally held with their peripheral faces in cylindrical relationship, the free terminal edges of said segments forming clamping means for receiving between them, and holding, the end of the paper tape, said segments being hingedly contractable to reduce the circumference of the periphery of the drum so that the roll of tape wound upon it may be readily slipped off of the drum for preservation as a record.

Still another object of the invention is to provide a winding drum, as described, in which the impelling means is a simple clockwork, the key arbor of which projects from a side of the drum for purpose of winding, the drum being revoluble about a fixed axle bridging the sides of a weighty base support which may be conveniently placed with respect to the business machine and will retain its position due to its weight, regardless of the tension maintained on the tape, the drum, including the axle being releasable from the base support so that it can be removed therefrom to facilitate removal of the rolled tape.

Other objects of the invention will appear as the following description of a practical embodiment thereof proceeds.

In the drawing which accompanies and forms a part of the subject invention, and throughout the figures of which the same reference characters have been used to denote identical parts:

Figure 1 is a side elevation, partly in section, of a portable rewinder embodying the principles of the invention;

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Figure 2 is a plan view;

Figure 3 is an end elevation viewed from the righthand side of Figure 1;

Figure 4 is a vertical transverse cross-section; Figure 5 is a sectional view taken along the line 5-5 of Figure 4;

Figure 6 is a vertical longitudinal section taken along the line 6-6 of Figure 4.

Referring now in detail to the drawings, the numeral 1 represents the base support as a whole, which is a heavy member having a flat bottom 2, and sides upstanding therefrom forming uprights 3 and 4, with transversely aligned square notches 5 opening in the tops thereof to receive the corresponding squared ends of a bridging axle 6, whereby the axle is prevented from rotating. A permanent keeper 7 overlies the notch in the upright 3, while a releasable keeper 8 normally blocks the notch in the upright 4. The keeper 8 is pivotally mounted at 9, at one side of the notch, and swings in a horizontal plane so as to uncover said notch. It has an operating knob 10. The squared ends of the axle 6 are a free fit in the respective notches, so that when the keeper 8 is in release position the adjacent end of the axle can be lifted free of its notch, permitting the opposite end of the axle to be slipped endwise from its notch. Between its polygonal end portions the axle is round in cross-section, and a winding drum 11 is revolubly mounted thereupon between the uprights 3 and 4, with enough lateral clearance between said drum and uprights to permit the axle with the drum to be tilted up and moved endwise, to the extent indicated, permitting removal of the axle and drum as a unit from the base support.

The thickness of the bottom 2 progressively increases from left to right, as indicated by the upwardly curved line 12 in Figure 1, making the lefthand end of the base support quite thick and solid, providing the necessary weight to cause the portable rewinder to stay in any position in which it may be placed. The relative thinness of the bottom at the righthand end provides a deep opening between the uprights at this end through which the drum, together with the roll of tape wound upon its periphery, may be withdrawn from the base support.

A pair of parallel spaced posts 13 are vertically mounted in transverse relation upon the thick lefthand end of the base support, of equal length, rising to a height approximately equal to that of the top of the drum 11. A cap piece 14 bridges the tops of the posts 13, having clamp sockets 15 which receive the upper ends of the posts and

are clamped thereto by means of the screws 15. The cap piece is formed with spaced transversely aligned slots 16 which define between each slot and the edge of the cap piece adjacent the drum, aligned hinge pintles 17. A swinging guide 18 is provided, consisting of an elongated transverse eye 19 extending substantially the width of the drum, and being adjacent to the upper arc thereof, having a slot 20 through which the tape is threaded, the length of which slot is substantially the width of the tape so that the edges of successive convolutions of tape wound on the drum will coincide. The eye 19 is carried at the ends of radial arms 21, the opposite ends of which are looped freely about the pintles 17. Figure 1 indicates that when the rewinding of the tape begins, the guide 18 has the position shown in full lines, but as the annulus of rolled tape builds up on the periphery of the drum, the guide progressively moves upward toward the position shown in broken lines. The removable arrangement of the cap piece 14 with respect to the posts 13 enables the cap piece to be interchanged with another having a guide with an eye of different length, to suit different widths of tape.

The drum consists of a normally closed cylinder having a peripheral face plate 22 and closed headers 23 and 24. The headers are outwardly flanged, as shown at 25 in Figure 4, and secured to the face plate at the flanges. The drum, including the face plate and headers, is divided into segments, a major segment and a minor segment. The side walls 26 and 27 of the major segment lap within the corresponding side walls 28 and 29 of the minor segment, the side walls 26 and 28 and 27 and 29 comprising the respective headers 23 and 24. The segments are pivotally connected at one end along a transverse axis which intersects their lapped side walls adjacent the circumference of the drum. The face plate portions of the segments are in end to end contact adjacent the pivotal axis, when the drum is in fully expanded condition. At the opposite ends of the segments the face plate portion of the major segment slightly overlaps the face plate portion of the minor segment, in contact therewith when the drum is in expanded condition. The side wall 27 of the minor segment has an outwardly projecting threaded stud 30, which plays in a slot 31 in the corresponding side wall 29 of the minor segment. A knurled nut 31' on the stud clamps the segments together when they are in expanded relationship.

The side walls of the major segment have coaxial perforations centrally of the drum through which the axle 6 freely passes, the drum being journaled upon the axle. A clockwork unit is enclosed within the drum. It comprises a pair of congruently arranged parallel plates 32, one of which is fixed to the inner face of the side wall 27 of the major segment, securing the clockwork to the drum. The plates are spaced apart by posts 33 at their corners. The axle 6 freely passes through said plates and carries a small gear 34 at an intermediate point between said plates. A large gear 35 meshes with the small gear 34 and is journaled on an arbor 36 parallel with the axle, said arbor being journaled in said plates and passing at its outer end freely through a hole in the side wall 27 to the outside of the drum, a winding key 37 being secured to its exposed end. A ratchet 38 is fixed to the arbor 36 close to the large gear 35. A holding pawl 39 engages the ratchet, being pressed thereagainst by a stiff spring 40 to which the pawl is attached,

the opposite end of said spring being anchored to the large gear. A helical spring 41 of many turns is anchored at one end to the arbor and at the other to a post 42 extending between the plates. The spring 41 winds in the direction of movement of the arbor permitted by the ratchet 38.

The winding is done while the drum is in position in the base support with the axle 6 fixed. In winding, the ratchet turns with the arbor, the spring 41 winding about the arbor. As viewed in Figure 5, the winding movement of the arbor 36 is in a counterclockwise direction. In unwinding, the spring 41 biases the ratchet to press against the holding pawl, which through the stiff spring 40 urges the large gear 35 to move in a clockwise direction. The large gear, however, cannot turn the small gear 34 with which it meshes, since the gear 34 is on the fixed axle, the result being that the large gear rolls around the small gear in a clockwise direction, carrying with it the entire drum.

In using the portable rewinder, it is placed adjacent the business machine, with the drum in alignment with the tape discharging from the machine. The free end of the tape is passed between the posts 13 and up through the slot in the eye 20, as shown at *a* in Figure 1. The drum is collapsed by loosening the knurled nut 31 and pressing the segments toward one another. This opens a slot between the lapped ends 43 and 44 of the face plate portions of the respective segments. The free end of the tape is inserted in this slot and the segments expanded until the ends 43 and 44 close against the inserted end of the tape, clamping it. The knurled nut 31 is then tightened. The drum is now turned through part of a revolution until the tape folds itself about the end 43, as shown in Figure 1. The clockwork is then wound. At the beginning of the winding movement the drum freely turns until the flight of tape between the business machine and drum becomes tensioned by the winding torque of the drum. When this state of tension is reached, the drum becomes static, thereafter winding the tape only responsive to its release by the business machine.

In a practical embodiment of the drum that has been made and tested, a single winding of the clockwork will wind up about one hundred convolutions or ninety feet of tape upon the drum, which is the average daily tape output of many business machines. When it is desired to remove the accumulated annulus of rolled tape from the drum, the axle is released in the manner set forth from the base support, the drum slipped forwardly through the open front end of the base support, the knurled nut loosened, the segments of the drum pressed together so as to reduce its circumference, whereupon, the annular roll of tape can readily be slipped off laterally.

While I have in the above description disclosed what I believe to be a preferred and practical embodiment of the invention, it will be understood by those skilled in the art that the specific details of construction and arrangement of parts, as shown, are by way of illustration and not to be construed as limiting the scope of the invention.

What I claim is:

1. Portable rewinding device for the continuous paper tape discharged from business machines of the type which are generally intermittently operated and discharge tape concur-

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rently with their operation, said rewinding device comprising a drum having a cylindrical peripheral face upon which the tape is wound and closed by headers perpendicular to the axis of said drum, an axle nonrotatably supported, upon which the drum is journaled, a gear fixed to the axle within said drum, clockwork mechanism within said drum carried thereby, including a gear reacting against said fixed gear to revolve said drum about said axle, said drum being formed in two segments transversely dividing its peripheral face, having end walls together constituting said headers, said end walls of one segment overlapping the end walls of the other segment and being hinged together at one end adjacent the circumference of said drum, the peripheral face of one segment being adapted to lap the peripheral face of the other segment at the free ends of said segments whereby one may be telescoped within the other to reduce the circumference of said drum and separate the lapped ends of said peripheral faces providing a space between said ends for the insertion of the end of the length of tape issuing from the business machine, and means for clamping said segments in normal expanded position in which the lapped ends of said peripheral faces clampably engage the inserted end of the tape.

2. A portable rewinding device as claimed in claim 1, one of the segments being of greater peripheral extent than the other, the clockwork being fixed to the larger segment on the inside thereof.

3. A portable rewinding device as claimed in claim 1, the clamping means for said segments comprising a slot in the overlapped portion of the end wall of one segment, a threaded stud on the corresponding underlapped portion of the end wall of the other segment, playing in said slot, and a clamp nut on said stud.

4. A portable rewinding device for the continuous paper tape discharged from business machines of the type which are generally intermittently operated and discharge tape concurrently with their operation, said rewinding device comprising a heavy base including laterally spaced upstanding sides with transverse aligned slots opening in the top thereof, of nonround cross-section, an axle having end portions of cross-section complementary to that of said slots and seating therein, said axle bridging the space between said sides, keepers over said slots for normally retaining said axle, one of said keepers being movable out of occlusive relation to the corresponding slot to permit release of said axle, a drum having a cylindrical peripheral face upon which the tape is adapted to be wound, said drum being closed by headers perpendicular to the axis of said drum, said drum being journaled upon said axle, a gear fixed to the axle within said drum, clockwork mechanism within said drum carried thereby including a gear reacting against said fixed gear to revolve said drum about said axle, said drum being formed in two segments dividing transversely its peripheral face and having end walls which together constitute said headers, said end walls of one segment overlapping the end walls of the other segment and being hinged together at one end adjacent the circumference of said drum, the peripheral face of one segment being adapted to lap the peripheral face of the other segment at the free ends of said segments whereby one may be telescoped within the other to reduce the circumfer-

ence of said drum and to separate the lapped ends of said peripheral faces providing a space between said ends for the insertion of the end of the length of tape issuing from the business machine, and means for clamping said segments in normal expanded position in which the lapping ends of said peripheral faces clampably engage the inserted end of the tape.

5. A portable rewinding device as claimed in claim 4, including a guide supported upon said base mounted on an axis parallel to that of the drum to swing adjacent the trailing end of the upper arc of said drum, said guide having a transverse eye at its free end fitting the width of the tape, through which the tape passes on its way to the peripheral face of said drum.

6. A portable rewinding device as claimed in claim 4, including a pair of transversely spaced posts mounted upon said base between which said tape passes, said posts extending upward to a point adjacent the level of the top of said drum, a cap piece bridging said posts, secured thereto, a guide hingedly mounted upon said cap piece on an axis parallel to that of said drum to swing adjacent the trailing end of the upper arc of said drum, said guide having a transverse eye in its free end fitting the width of the tape through which the tape passes on its way to the peripheral face of said drum.

7. A portable rewinding device for the continuous paper tape discharged from business machines of the type which are generally intermittently operated and discharge tape concurrently with their operation, said winding device comprising a heavy base including laterally spaced upstanding sides with transverse aligned slots opening in the tops thereof, of non-round cross-section, an axle having end portions of cross-sectional shape complementary to that of said slots nonrotatably seated in said slots, said axle bridging the space between said sides, keepers over said slots for normally retaining said axle, one of said keepers being movable out of occlusive relation to the corresponding slot to permit release of the axle from said base, a drum having a cylindrical peripheral face upon which the tape is wound, said drum being closed by end headers perpendicular to the axis of said drum, said drum being journaled on said axle, a gear fixed to the axle within said drum, spring wound clockwork mechanism within said drum carried thereby including a gear reacting against said fixed gear to revolve said drum about said axle, said drum being formed in two segments dividing transversely its peripheral face and having end walls which together constitute said headers, said end walls of one segment overlapping the end wall of the other segment and being hinged together at one end adjacent the circumference of said drum, the peripheral face of one segment being adapted to lap the peripheral face of the other segment at the free ends of said segments whereby one may be telescoped within the other to reduce the circumference of said drum and to separate the lapped ends of said peripheral faces providing a space between said ends for the insertion of the end of the length of the tape issuing from the business machine, one of the segments being of greater peripheral extent than the other, the clockwork being fixed to the inside of an end wall of the larger segment and having a key arbor projecting through said end wall, means for clamping said segment in normal expanded position in which the lapping ends of said peripheral faces

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clampably engage the inserted end of the tape, a pair of transversely spaced posts mounted upon said base between which said tape passes, said posts extending upward to a point adjacent the level of the top of said drum, a cap piece bridging said posts and secured thereto, a guide hingedly mounted upon said cap piece on an axis parallel to that of said drum, swingable adjacent the trailing end of the upper arc of said drum, said guide having a transverse eye in its free end fitting the width of the tape, through which the tape passes on its way to the peripheral face of said drum.

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