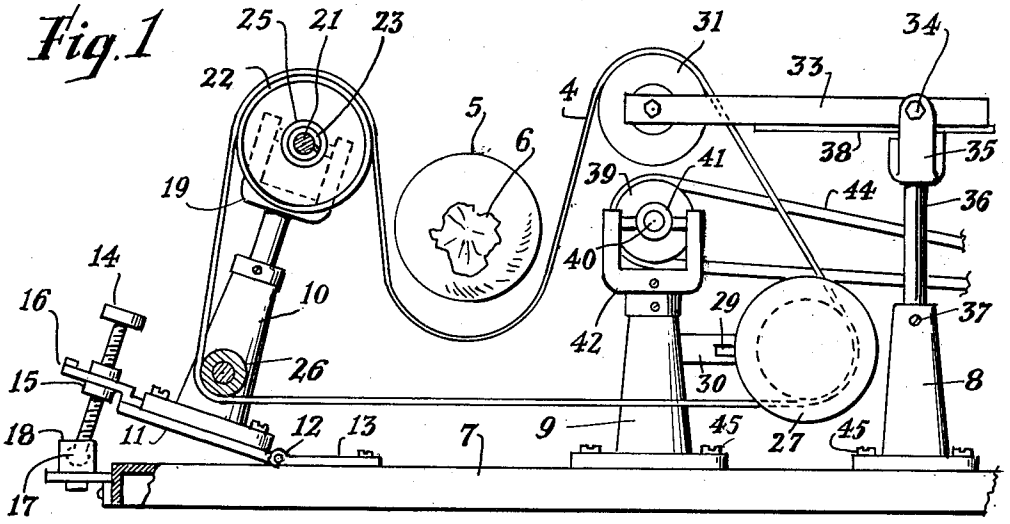
July 4, 1950 H. RUMSEY, JR 2,514,293

WRAPPING AND TWISTING MACHINE

Filed July 27, 1948

Fig. 1



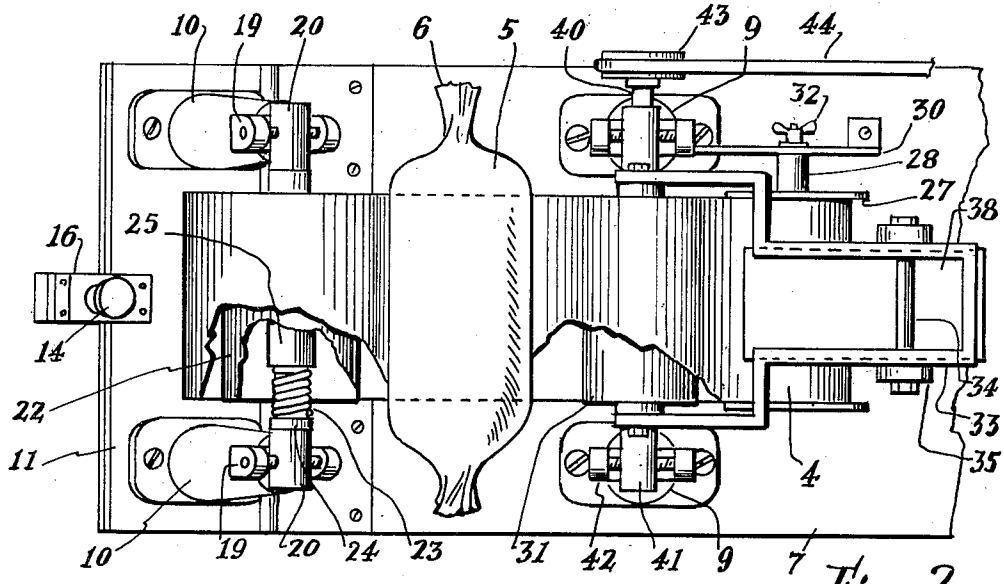
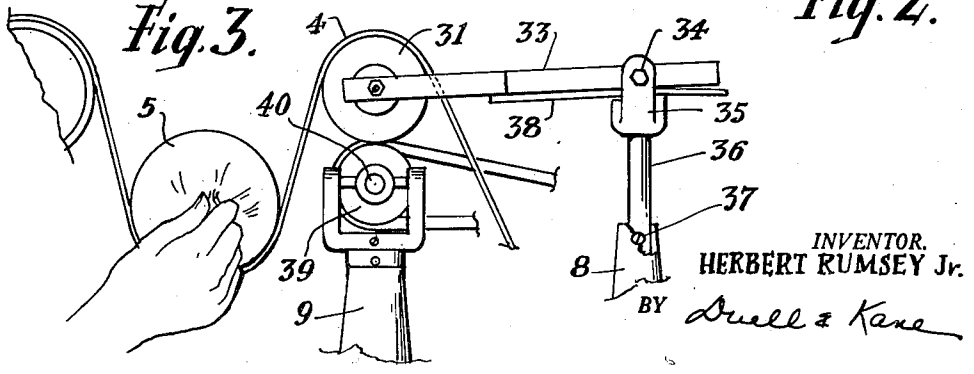


Fig. 2.

Fig. 3.



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WRAPPING AND TWISTING MACHINE

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4 Claims. (Cl. 93—5)

1

This invention relates to an improved machine for wrapping articles in sheet material, more particularly to a machine for twisting the protruding ends of sheet material that has been previously wrapped or folded around an article.

Twisting and wrapping apparatus such as shown in my prior Patent No. 2,346,613 granted April 11, 1944, have heretofor been available in which an endless belt is used to rotate the article to be wrapped and thereby twist the protruding ends of the wrapping. In using such apparatus, wrapping material is first wrapped or folded around the article with the ends of the material protruding beyond the ends of the article. The protruding ends are grasped in the hands of the operator and the article is pressed against the moving belt whereby the article is rotated and the protruding ends are twisted.

The operation of the belt has heretofor been controlled by a switch or clutch or brake mechanism. Accordingly, it has been necessary for the operator either to press the article against an already moving belt with the result that the article, particularly where it is heavy is often accidentally released by the operator, or, in the alternative, it is necessary for the operator, as a separate operation, to turn the belt on or off for each twisting operation. This, of course, is prohibitively slow and cumbersome.

It is an object of the invention to overcome these disadvantages and to provide improved wrapping or twisting apparatus of the above character in which the operation of the device can be controlled by the pressure of the article to be wrapped against the belt. Thus, the belt is initially stationary. When the article is pressed against the belt it causes the belt to move, with the result that the article is rotated and the protruding ends of the wrapper are twisted. When the twisting operation is completed, the operator releases the pressure of the article against the belt and the operation of the apparatus immediately stops. The advantages of my invention in time saving and also in avoiding accidental release of the package and consequent injury to the operator or damage to the package will be apparent to everyone experienced in this art.

In the accompanying drawing—

Fig. 1 is a side elevational, partially sectional view of apparatus employing my invention showing it in stationary or inoperative position;

Fig. 2 is a top plan view, partially broken away, of the apparatus; and

Fig. 3 is a detailed side view, also partially broken away, showing the article pressed against the belt to cause the operation of the apparatus.

2

My invention is applicable to apparatus used for wrapping various types of sheet material around articles, for instance, applying the outer wrapping to a package or the casing to a food product. It is useful with the various synthetic plastic sheet material such as cellophane, cellulose acetate, vinyl resin films, Saran, Pliofilm and the like as well as to paper and also natural and synthetic casings.

In the accompanying drawing, I have shown an article 5 around which sheet material of the above indicated character has been wrapped so as to provide the protruding ends 6. My apparatus is useful in twisting these protruding ends.

The illustrated apparatus comprises generally an endless belt 4 suitably supported so as to be driven or rotated when pressure is applied to the operating portion thereof. The mechanism for supporting the belt and causing its operation comprises a base 7, having a standard 8 and a pair of standards 9 secured directly thereto as by means of screws 45. The standard 8 is approximately centrally positioned between the two sides of the base adjacent one end thereof and the standards 9 are in spaced confronting relationship to each other and mounted adjacent the two opposite sides of the base. Spaced from the standards 9 and mounted near the opposite end of the apparatus are a pair of similar standards 10, also arranged in spaced confronting relationship with respect to each other.

The standards 10 are adjustably supported or mounted by being connected to a plate 11 which in turn is hinged at 12 to a plate 13 mounted on the support. Opposite the hinge 12 suitable adjusting mechanism is provided in the form of knurled head screw 14 in threaded engagement with sleeve 15 carried by bracket 16 on plate 11. The lower end of the screw is provided with a ball enlargement 17 in engagement with a ball socket formed in bracket 18 mounted on the end of base 7. By rotating the screw 14 in one direction the plate and standards 10 are tilted upwardly and rotation in the opposite direction results in lowering the plate and standards.

Each of the standards 10 carries a yoke 19 which in turn supports a bearing 20 in which a transverse shaft 21 is carried. Suitably mounted on the shaft is a pulley or belt supporting roller 22 which has a friction type of surface such as hard rubber so as to frictionally grip and engage the belt 4. In order to provided a bight in the upper flight of the belt, as will be more fully explained, I provide a suitable drag to retard the

rotation of pulley 22 and this may take the form of a helical spring 23 disposed around shaft 21 in partially compressed form so as to exert force against the washer or spacer 24 at one end and collar 25 at the other end. The collar 25 is secured to and rotates as a unit with pulley 22.

Belt 4 extends around pulley 22 and thence extends downwardly around idler or guide pulley 26 which is journaled between the lower portions of standards 10. From that point the belt extends around adjusting pulley or roller 27 journaled on a shaft 28 having a threaded end portion projecting through slot 29 in supporting bracket 30 engaged by wing nut 32. By shifting the pulley 27 to the left as viewed in the drawings, the amount of slack in the endless belt can be increased. By shifting it to the right the amount of slack can be decreased. The pulley can be retained in its adjusted position by tightening wing nut 32

The belt thence extends upwardly and around pulley 31 likewise having a friction surface, which is mounted for rotation between the two arms of a yoke-like bracket 33 pivotally supported at 34 on the yoke 35 formed on upper end of shaft 36. Shaft 36 extends into and is supported by tubular standard 8 and can be adjusted upwardly or downwardly and thereafter held in adjusted position by means of a set screw 37.

Due to the pivotal connection between bracket 33 and yoke 35 it will be appreciated that the bracket can shift or pivot within predetermined limits. It is normally maintained in horizontal position by means of flat leaf-spring 38 mounted on the upper end of shaft 36 in horizontal position between the two arms of yoke 35. The normal horizontal position of bracket 33 is illustrated in Fig. 1. When force in a downward direction is exerted on the left end of the bracket as viewed in the drawing it pivots downwardly against the tension of spring 38 as shown in Fig. 3. When the force is released, the spring returns the bracket to its normal horizontal position.

After passing over pulley 31 endless belt 4 thence extends over pulley 22.

The apparatus is adjusted so as to provide slack in the belt and the belt is suitably driven in a counter-clockwise direction from pulley 31. Due to the fact that a drag is provided on pulley 22 the slack accumulates between pulleys 31 and 22 causing a bight, as shown, in the upper flight of the belt.

So as to provide for the rotation of pulley 31 and the consequent operation of the belt I provide a drive roller 39 likewise having a friction type of surface a short distance beneath and parallel to pulley 31. Drive roller 39 is fixedly mounted on shaft 40 which in turn is journaled in bearings 41 carried by yokes 42 mounted in standards 9. One end of the shaft 40 projects beyond its bearing as shown in Fig. 2 and is provided with pulley 43 which is driven by a suitable prime mover such as an electric motor (not shown) by means of belt 44.

Belt 4 is made of a suitable friction material so that the inner surface will have gripping engagement with pulleys 31 and 22 and so that the outer surface will cause the rotation of the article to be wrapped. For this purpose I have found that pliable rubber is very satisfactory.

In using my apparatus it is first adjusted so that pulleys 31 and 22 are spaced a greater distance apart than the diameter of the article to be wrapped. This can be accomplished by tilting standard 10 and pulley 22 through the medium

of screw 14. Thereafter, the slack in the belt is adjusted so as to provide a bight extending beneath pulleys 22 and 31 as shown so that the article to be wrapped can be engaged entirely by the unsupported portion of the bight of the belt. The slack is adjusted by shifting adjusting pulley 27 to the left or right as required and thereafter tightening the wing nut 32. A final, more accurate adjustment can be obtained by a slight rotation of screw 14.

In normal operation the highth of the bracket 33 is adjusted so that the surface of pulley 31 is positioned a very slight distance above the surface of roller 39 as shown in Fig. 1 and set screw 37 is then tightened to maintain the adjusted position. The prime mover can then be operated so as to cause the rotation of drive roller 39 but normally this will not affect the pulley 31 or belt 4. The article 5 to be wrapped is then encased in the sheet material with the ends 6 protruding from the end thereof. The ends 6 are grasped in the hand of the operator and lowered into the bight of belt 4 between pulleys 22 and 31. When it is firmly brought into engagement with the belt and pressed into engagement therewith the pressure will cause bracket 33 to pivot downwardly against the force of spring 38 bringing pulley 31 into engagement with drive roller 39 whereupon the pulley 31 is caused to rotate which in turn causes the operation of belt 4. In this connection drive roller 39 should be rotated in a clockwise direction so as to cause pulley 31 and belt 4 to be operated in a counter-clockwise direction. The belt is thus pulled over pulley 22 around idler 26 and pulley 27 to pulley 31 and due to the drag provided on pulley 22 the slack or bight is accumulated in the upper flight of the belt between pulleys 22 and 31.

The operation of the belt causes the rotation of the article 5 and due to the fact that the ends 6 are held in the hands of the operator they are twisted. When the ends have been sufficiently twisted the operator raises the article upwardly, releasing the pressure on the belt with the result that spring 38 returns bracket 33 to its normal horizontal position as shown in Fig. 1 with pulley 31 out of engagement with drive roller 39.

It will thus be seen that the operator brings the object into contact with a stationary belt minimizing the danger of accidentally releasing or dropping the ends of the package. Also, the apparatus only operates while pressure is exerted against the belt in the bight thereof. Should the pressure at any time be released the operation of the apparatus will immediately stop thereby minimizing the danger of accidental injuries or damage.

If it should be desired to provide continuous operation, bracket 33 can be lowered so as to bring pulley 31 into constant contact with drive roller 39 and thereafter set screw 37 is tightened in the newly adjusted position.

It will thus be seen that I have provided improved wrapping apparatus particularly a machine for twisting the protruding ends of wrapping material in which the apparatus can be automatically controlled in such a manner that it will operate only when the article to be wrapped is applied to the twisting or rotating device. It will also be seen that the apparatus is relatively inexpensive to make, simple to operate and results in considerable saving of time and minimizes the danger of injury to the operator and damage to the package or contents. Modi-

fications may of course be made in the illustrated and described embodiment of my invention without departing from the invention as set forth in the accompanying claims.

I claim:

1. In apparatus for twisting the protruding ends of a wrapper or casing of an article, the combination of an endless belt for engaging and rotating the article, means including a pulley for supporting the belt, a rotatable drive member mounted adjacent the pulley, and a shiftable mounting for the pulley supporting the pulley for rotary motion and so that it may be shifted from a position free from operative engagement with the drive member to a position in operative engagement with the drive member said shiftable mounting having means for normally holding the pulley in position free from operative engagement with the drive member.

2. In apparatus for twisting the protruding ends of a wrapper or casing of an article, the combination of an endless belt for engaging or rotating the article, means including a pair of spaced pulleys for supporting the belt with slack therein and with a bight in one of the flights thereof, a drive member mounted adjacent one of the pulleys, a shiftable mounting for said last mentioned pulley supporting said pulley for rotary motion and so that it may be shifted from a position free from operative engagement with

the drive member to a position in operative engagement therewith, and yielding means for normally holding the mounting and pulley in position where the pulley is free from operative engagement with the drive member and so that it may be shifted under predetermined force into engagement therewith when the article to be wrapped is pressed against the belt.

3. Apparatus for twisting the protruding ends of a wrapper or casing of an article as set forth in claim 2 in which the yielding means is a spring in engagement with the shiftable mounting.

4. Apparatus for twisting the protruding ends of a wrapper or casing of an article as set forth in claim 2 in which the pulleys are shiftable within predetermined limits towards and away from each other and in which a separate slack adjusting pulley in engagement with the belt and having a shiftable mounting is provided for adjusting the slack in the belt.

HERBERT RUMSEY, JR.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,346,613	Rumsey	Apr. 11, 1944