April 11, 1944. H. RUMSEY, JR 2,346,613

WRAPPING MACHINE

Filed March 14, 1941 2 Sheets-Sheet 1

Fig. 1.

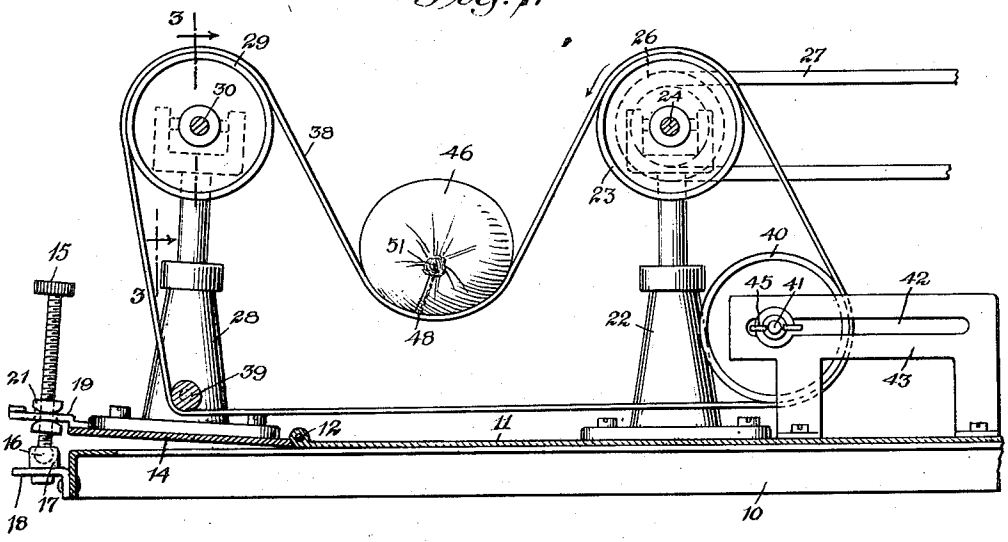
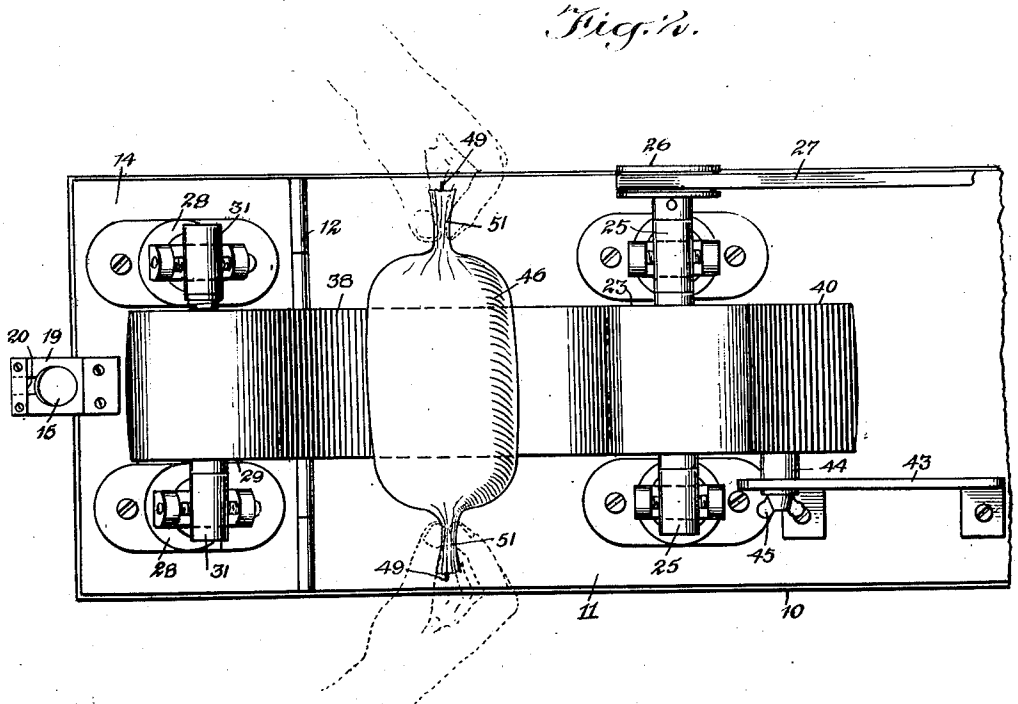


Fig. 2.



WITNESSES

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Fig. 3.

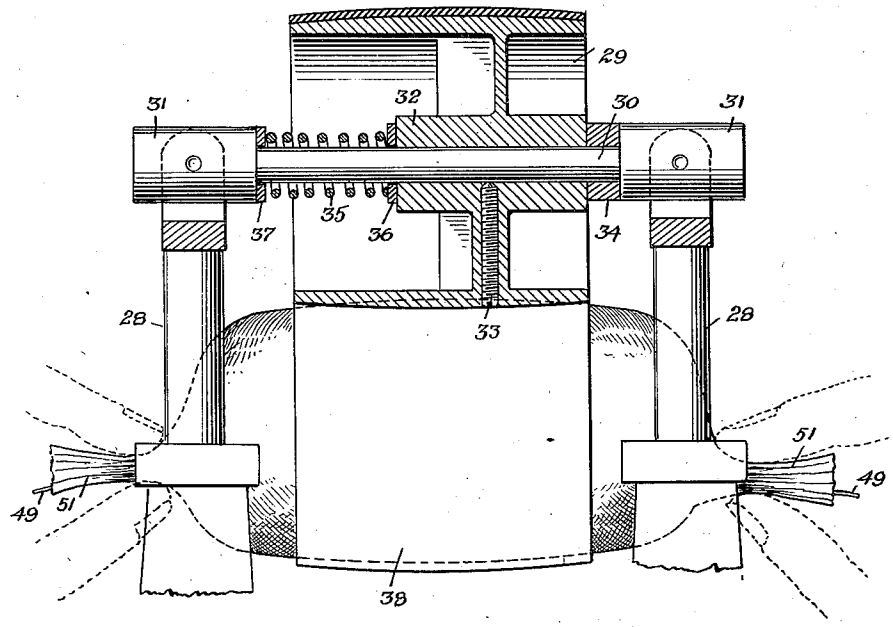


Fig. 4.

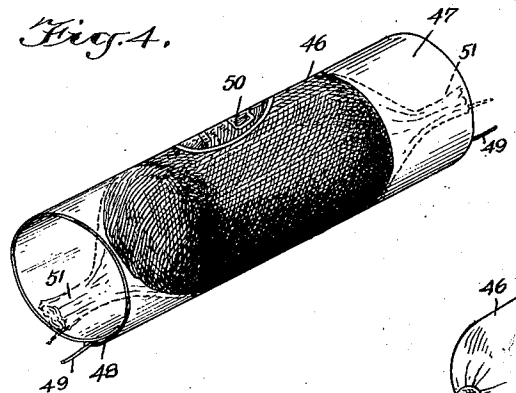


Fig. 5.

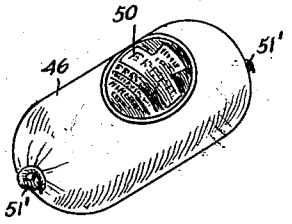
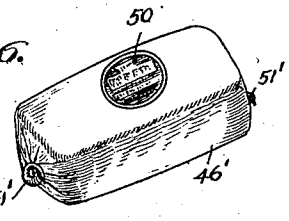


Fig. 6.



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2,346,613

WRAPPING MACHINE

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Application March 14, 1941, Serial No. 383,325

6 Claims. (Cl. 93—2)

This invention relates to an improved machine and method for wrapping articles in sheet material. More specifically the invention relates to an apparatus and method for twisting the protruding ends of sheet material which has been partially folded or wrapped around an article. My apparatus and method are particularly suitable for use in twisting the ends of sheet wrapping material such as regenerated cellulose commonly known as Cellophane.

At the present time it is desirable to provide many different types of articles with a wrapping of transparent regenerated cellulose. This material is stretchable when moistened and I have found that a very attractive package can be formed by wrapping moistened regenerated cellulose around the sides of the package so that it projects beyond the ends. The protruding ends are then twisted so as to stretch the material around the package and the twisted ends are retained in position while the material dries. The drying of the material causes shrinking thereby helping to eliminate creases and wrinkles and producing an attractive finished package. The twisting of the ends of the material has caused difficulty in that it is a slow tedious operation requiring considerable labor.

It is an object of the present invention to overcome these difficulties and to provide an improved wrapping method and apparatus for twisting the protruding ends of sheet material particularly regenerated cellulose around an article which has been partially wrapped in the material.

A further object is the provision of an improved method and apparatus of the above character which will not damage the article being wrapped or the wrapping material which is comparatively fragile and is easily torn and fractured.

It is another object of this invention to provide an improved wrapping machine for twisting the projecting ends of wrapping material which has been partially wrapped around an article, which is of comparatively simple and rugged construction, which may be adjusted so as to be used in wrapping articles of various sizes and shapes, and which may be operated by comparatively unskilled labor.

In the accompanying drawings,

Fig. 1 is a side elevation partly in section of a wrapping machine embodying my invention,

Fig. 2 is a top plan view of the wrapping machine,

Fig. 3 is a detailed sectional view in the direction of the arrows on the line 3—3 of Fig. 1,

Fig. 4 is a perspective view of an article partially wrapped in regenerated cellulose illustrating in dotted lines the manner in which the package is prepared before my wrapping machine is used to twist the projecting ends,

Fig. 5 shows the same article as illustrated in Fig. 4 after my wrapping machine has been used to twist the projecting ends and thereby complete the wrapping operation; and

Fig. 6 illustrates another completely wrapped article of different shape than that shown in Fig. 5.

My improved machine and method may be used in wrapping many different types of articles in regenerated cellulose and similar sheet material. However it is particularly suited for use in wrapping certain meat products of a plastic or semi-plastic character such as smoked pork butts and in the accompanying drawings my invention is illustrated as being used for wrapping a meat product of this character.

My apparatus preferably comprises a base 10 having fixedly secured to the upper surface thereof a metallic plate 11. The plate 11 covers most of the upper surface of the base but terminates a short distance from one end, and pivotally secured to this end as by means of a hinge 12 is a plate 14. The plate 14 is provided with an adjusting device whereby it may be pivoted through an arc from a position in the same plane as the plate 11 to a position inclined at a relatively sharp angle thereto. In Fig. 1 the plate is illustrated as adjusted to an intermediate position.

The adjusting device for the plate 14 may take any desired form such as the screw 15 having a knurled head at its upper end and ball 16 at its lower end which fits into a ball socket 17 the socket being mounted on a bracket 18 attached to the base 10. Mounted on the pivotal plate 14 is a guide 19 provided with a centrally positioned slot 20 which accommodates the shank of the screw 15. Also extending through the slot 20 is the threaded sleeve 21 which is threaded to the screw 15. The sleeve 21 is formed with enlarged heads at the top and bottom thereof which engage the upper and lower surface of the guide member 19 and prevent the sleeve from escaping from the slot 20. The central portion of the sleeve is fitted to the slot in such a fashion that it can slide lengthwise of the slot but cannot rotate with respect thereto.

It will thus be seen that when the screw 15 is rotated in one direction, it causes the sleeve 21 to shift upwardly which in turn causes the guide member 19 and pivotal plate 14 to tilt upwardly. Conversely when the screw is rotated in the opposite direction, the sleeve, guide and pivotal plate 14 will shift downwardly.

Mounted on the fixed plate 11 of the base are a pair of spaced posts or standards 22 between which is disposed the drive pulley 23 secured to shaft 24 which in turn is journaled in the bearings 25 mounted on the tops of the posts 22. The shaft 24 projects beyond one of the bearings 25 and has secured to the end thereof a

pulley 26 which is connected by means of a belt 27 to some suitable driving mechanism such as an electric motor. As will be later explained the shaft 24 and pulley 23 are normally driven in a counterclockwise direction as viewed in Fig. 1.

Mounted upon the pivotal plate 14 are another pair of posts or standards 28 substantially similar to the standards 22 and disposed between the standards 28 is a driven pulley 29 which is mounted upon a shaft 30 journaled in the bearings 31 which in turn are mounted on the top of standards 28. The driven pulley 29 is preferably provided with some suitable means for causing a drag or resistance to its rotation and this may take the form illustrated in Fig. 3. It will be noted that the pulley 29 is provided with a sleeve 32 disposed around the shaft 30 and fixed thereto as by means of a set screw 33. The sleeve 32 only extends for a portion of the width of the pulley. Between one end of the sleeve and the adjacent bearing 31 I provide a suitable spacing collar 34. Between the other end of the sleeve 32 and the adjacent bearing I provide a spiral spring 35 which surrounds the shaft 30 and exerts tension at either end against the washers 36 and 37 which are in engagement with the sleeve 32 and the bearing 31. It will be appreciated that the tension thus exerted by the spring offers a slight drag or resistance to rotation of the pulley 29.

Disposed around the pulleys 23 and 29 is an endless belt 38 which may be made of leather, rubber, woven fabric or similar material. In addition to extending around the pulleys 23 and 29 the endless belt also extends around the idling guide roller 39 which is journaled between the lower portions of the standards 28 and around a slack adjusting pulley 40 which is rotatably mounted on a shaft 41. The shaft 41 is supported in a slot 42 formed in the frame 43 which is suitably mounted upon the fixed plate 11. By shifting the shaft 41 along the slot 42 the amount of slack in the endless belt 38 may be readily controlled and adjusted. So as to retain the slack adjusting pulley 40 in any desired adjusted position, I provide a collar 44 between the pulley 40 and the frame 43 and also a wing nut 45 which is threaded to the outer end of the shaft 41. By loosening the wing nut 45 the shaft may be shifted along the slot 42. When the wing nut is tightened, it will be retained in the adjusted position.

In operating the machine which has been described, the drive pulley 23 is caused to rotate in a counterclockwise direction as viewed in Fig. 1 with the result that the belt 38 is caused to rotate in the same direction. When the machine is operated in this fashion the slack part of the belt is disposed across the top span extending between the drive pulley 23 and the driven pulley 29, while the driving part of the belt extends across the lower span. The primary or fixed adjustment of the amount of slack in the belt is obtained through the slack adjusting pulley 40. In other words the pulley 40 is shifted to a position which provides the approximate amount of slack that is desired in the belt. Thereafter a more sensitive adjustment of the amount of slack is obtained through the medium of the screw 15. It will be seen that by tilting the pivotal plate 14 upwardly the amount of slack is increased and by tilting it downwardly the amount of slack is decreased.

In using my device the slack adjusting pulley 40 is shifted to a position so as to provide considerable slack in the endless belt 38 so as to provide a substantial bite in the slack portion thereof between the driving pulley 23 and the driven pulley 29. This bite should preferably extend to a plane beneath the pulleys as shown in Fig. 1 and the pulleys should preferably be spaced apart a distance greater than the diameter of the article being wrapped. In this may the article being wrapped will contact only the unsupported portion of the belt and will not engage any portion of the belt which is backed up by the pulley. This is an advantage in that it places a minimum amount of strain on the regenerated cellulose or other wrapping material.

My method and the operation of the apparatus is best understood by a brief description of the manner in which an article is wrapped. In the drawings with the exception of Fig. 6, I have illustrated the wrapping of a substantially cylindrical body of plastic or semi-plastic meat 46 such as a smoked pork butt. A sheet of regenerated cellulose or similar wrapping material is first wrapped fairly tightly around the article forming an open tube, projecting beyond the article being wrapped, at both ends. It will be noted that the edges of the tube overlap on one side of the article as indicated at 48 and if desired a wire 49 may be placed adjacent the overlapping edges so as to retain the ends in position after they have been twisted as taught in my Patent No. 2,107,086 although the wire may be omitted if desired.

After the article has been partially wrapped in this fashion the projecting ends of the wrapping material are compressed so as to form projecting stems 51 at the two ends of the article in the manner indicated in Figs. 2 and 3 and in dotted lines in Fig. 4. In this connection the stems should be formed eccentrically with respect to the central axis of the article so as to be positioned nearer to the overlapping edges 48 as clearly shown in Figs. 3 and 4. The purpose of this is to eliminate, as far as possible, any wrinkles or creases in the wrapping material on the surface of the article opposite the overlapping edges thereby presenting a display face of attractive appearance. In this connection a label may be provided on the display face of the package as indicated at 50.

The sheet of regenerated cellulose which has thus been partially wrapped around the article is moistened with water either before or after being applied to the article. However, under any circumstance the regenerated cellulose should be moistened before the projecting ends are twisted by my improved wrapping machine. After the moistened regenerated cellulose has been partially wrapped around the article and the projecting stems 51 have been formed, the operator grasps the projecting stems in his two hands as indicated in Figs. 2 and 3 and the central portion of the package is placed into contact with approximately the central portion of the bite formed in the upper span of the belt with the projecting stems extending outwardly on the two sides of the belt as shown most clearly in Figs. 1 and 2.

It will be appreciated that the belt is rotating in a counterclockwise direction. The frictional engagement between the package and the belt causes the package to rotate and since the stems are grasped firmly in the hands of the operator they will be twisted as shown at 51'. The package should be held in engagement with the belt

a sufficient length of time to tightly twist the stems and to cause the regenerated cellulose sheet material to be stretched smoothly over the package. Since the regenerated cellulose material has been previously moistened it is stretchable and will stretch slightly under the tension exerted by the twisting of the stems. The package should then be removed from engagement with the belt and the stems should be held in twisted relationship until the regenerated cellulose has dried. As previously mentioned the drying of the regenerated cellulose causes shrinking which in turn causes the material to stretch more tightly over the package.

Since the stems have been formed eccentrically with respect to the central axis of the article the display face which is opposite the overlapping edges will be substantially free from wrinkles and creases.

In the package illustrated I have employed a wire retaining member 49 which serves in and of itself to retain the stems in twisted relationship. Where a wire member of this character is not employed, the stems may be tied or otherwise retained in twisted relationship.

The article 46' illustrated in Fig. 6 is substantially of rectangular shape in cross section. A package of this type is wrapped in the same manner as the package illustrated in the remaining figures of the drawings. However due to its shape, it is desirable to increase the size of the bite in the slack part of the belt to a slight degree and this may be accomplished by turning the screw 15 so as to tilt the plate 14 upwardly to a greater degree. Where a larger package is to be wrapped the size of the bite may be further increased and where a smaller package is to be wrapped the size of the bite may be decreased.

I have found that in carrying out my invention it is desirable to form the bite of such a size that only the unsupported portion of the belt will contact the package and in this connection it is preferable for the bite to extend beneath the pulleys. In order to facilitate the use of the apparatus, I also prefer to space the pulleys apart a greater distance than the diameter of the object being wrapped so that the package can be placed in engagement with and removed from engagement with the belt without shifting the pulleys.

It should be understood, of course, that modifications may be made in the illustrated and described embodiment of my invention such as wrapping articles other than meat products and utilizing wrapping materials other than regenerated cellulose.

I claim:

1. A wrapping machine to be used in twisting the projecting ends of sheet wrapping material which has been wrapped around the sides of a package which comprises supporting means, a driven pulley mounted on the supporting means for rotation, a drive pulley mounted on the supporting means for rotation, an endless belt of sufficient length to form a bite connected between the pulleys, means for applying a drag to the driven pulley and means for rotating the drive pulley in a direction whereby the upper span of the belt moves from the drive pulley to the driven pulley whereby the bite is formed in the upper span.

2. A wrapping machine for twisting the projecting ends of sheet wrapping material which has been wrapped around the sides of a package comprising a supporting member, a pair of pulleys mounted a fixed predetermined distance apart on the supporting member for rotation, an endless belt connected between the pulleys and means for rotating one of the pulleys so that the slack portion of the belt is disposed in the upper span between the pulleys, the pulleys being spaced apart a greater distance than the width of the package to be wrapped and said belt being of sufficient length while the pulleys are so spaced to form a bite extending to a plane beneath the pulleys and of sufficient size that when the package is placed therein it is embraced solely by the portions of the belt which are free from engagement with the pulleys.

3. A wrapping machine for twisting the projecting ends of sheet wrapping material which has been wrapped around the sides of a package comprising a fixed supporting member, a pulley mounted on the fixed supporting member, a shiftable supporting member, a pulley mounted on the shiftable supporting member, an endless belt disposed between the pulleys, means for rotating one of the pulleys so as to drive the endless belt, primary slack adjusting means including a member in engagement with the belt and shiftable so as to adjust the approximate amount of slack in the belt and a secondary slack adjusting means for more accurately adjusting the amount of slack in the belt and comprising means for shifting the shiftable supporting member.

4. A wrapping machine as set forth in claim 3 in which the first-mentioned pulley is the drive pulley and the second-mentioned pulley is a driven pulley and is provided with means for resisting its rotation.

5. A wrapping machine for twisting the projecting ends of sheet wrapping material which has been wrapped around the sides of a package comprising a base, a fixed support mounted on the base, a drive pulley mounted for rotation in said fixed support, a shiftable support pivotally mounted on the base so that it may be tilted towards and away from the fixed support, a driven pulley mounted on the shiftable support for rotation, an endless belt connected between the pulleys, means for applying a drag to the driven pulley, means for rotating the drive pulley in a direction so that the slack portion of the belt is disposed in the upper span between the drive and driven pulleys, a primary slack adjusting device including a pulley engagable with the belt and mounted on said base so as to be shiftable to adjust the approximate amount of slack and a secondary slack adjusting device for more accurately adjusting the amount of slack in the belt and comprising means for causing said shiftable support to tilt towards and away from the fixed support.

6. A wrapping machine as set forth in claim 5 in which the belt is of sufficient length to provide a bite in the slack portion thereof which extends beneath the pulleys and in which the pulleys are spaced a greater distance apart than the width of the package to be wrapped.

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