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APPARATUS FOR WRAPPING ONE LENGTH OF MATERIAL WITH ANOTHER

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1. Claim. (Cl. 53—83)

This invention relates to a machine for wrapping or encasing one continuous moving length of material with another. It may be employed in connection with a number of different materials. One contemplated use is its application to wrapping a continuous length of lace, ribbon and the like with a wrapping of cellophane or the like.

An object of the invention is to provide simple and practical apparatus for wrapping one length of material with another.

Another object of the invention is to provide apparatus for encasing one material in another in a continuous operation.

Another object of the invention is to provide apparatus whereby a moving length of material may be continuously encased in another moving length of material.

Another object of the invention is to provide an elongated package comprising a length of material surrounded by a wrapping which in cross section is unitary and endless.

Another object of the invention is to provide apparatus of the above mentioned kind which is flexible to accommodate different thicknesses and widths of material and process them at different speeds suitable to different materials.

Other objects of the invention will be in part obvious or in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements, arrangements of parts, and in the several steps and relation and order of each of said steps to one or more of the others thereof, all as will be pointed out in the following description, and the scope of the application of which will be indicated in the following claim.

The invention will best be understood if the following description is read in connection with the drawings, in which:

Figure 2 is a side elevation of apparatus embodying the invention;

Figure 3 is a fragmental elevation, partly in cross section, and on an enlarged scale, of part of the device shown in Figure 1;

Figure 4 is a top elevation of the structure shown in Figure 2;

Figure 5 is a fragmental end elevation looking toward the left in Figure 1;

Figure 6 is a detail view taken on the line 5-5 of Figure 3;

Figure 7 is a fragmental view of the winding apparatus shown in the upper right hand of Figure 1;

Figure 8 is an end view, partly in cross section, taken on the line 8-8 of Figure 7; and

Figure 9 is a perspective view of a length of lace wrapped in cellophane and wound on a support.

In the embodiment of the invention described herein a continuous length 10 of material, such for example as a strip of lace, is led from any source of supply over a guide spool 12 mounted on an upright 14, to and between guide pins 16a and 16b and over a guide bar 18 into and through a right angled tube-like shielding or confining member 20, after which it passes, together with its wrapping, between pressure rolls 88 and 100 by which it is advanced, as will be explained.

The guide pins 16a and 16b project in parallel relation from bracket 22 which extends from the bar 24 the ends of which are bent at right angles and secured by bolts 27 to the upright frame members 26a and 26b respectively, which, as shown, are interconnected at the base by the cross member 26c. Guide rod 18 is supported between the brackets 26a and 26b which project from cross bar 24.

The upright 14 is shown projecting upwardly from a table top or support surface 30, which may be elevated by legs 31 and across the upper surface of which the cross member 26c extends. On the opposite side of the frame 26 from the upright 14 is the upright 32 on which a rewinding spool 34 is rotatably mounted for winding up the wrapped length of material, as will be explained.

On the inner side of upright 32 as shown in Figure 2, is a bracket 38 extending up from the table top 35, and removably supported on said bracket and on the cross member 36 extending between the upright frame members 25a and 25b, is a platform 40. As shown the platform 40 is secured on said bracket 38 and said cross member 36 as by screws 42, so that one platform may be readily substituted for another having a channel of different width as will be explained.

The vertical portion 28a of the right angled confining guide member 20 which is preferably closed or substantially closed and shaped to conform to the shape of the material to be wrapped, is supported on bracket 44 projecting from cross bar 24. On platform 40 a channel 46 is provided the width of which will depend upon the width of the material to be wrapped. Channel 46 is defined by two side plates 48a and 48b the height of which will also depend upon the particular material to be wrapped and the wrapping employed. The lower, horizontal portion 28b of the confining member 20 is suspended in said channel parallel with the bottom of the
are bifurcated at 88 and 88b said bifurcations being adapted to receive and rest on the pins 80 and 80b respectively projecting outwardly from the said vertical uprights 25a and 25b respectively. Member 84 is movable with respect to the uprights 25a and 25b to the extent of the length of the slots 88a and 88b which are sufficiently long to permit the bifurcated lower ends of said U-shaped member 84 to be lifted above and dropped down on the pins 90 and 90b thus locking said member 84 in upright, inoperative position to give free access to the platform 48.

Projecting from opposite legs of the member 84 are brackets 92a and 92b supporting the cup-shaped bearings 94a and 94b respectively between which is rotatably mounted the spindle 95 on which said sealing roll 80 is fixedly mounted. The roll 90 and spindle 95 are rotated by frictional engagement between flange 89 projecting radially from around the periphery of said roll at its median line and the portion of the web of wrapping material W overlying the portion 20a of tube 20, the web being advanced by the action of the pressure 88 and 100 as will be described. Also fixed on spindle 96 by pressure screw 103 is an annular bushing 102 (Figure 5), which may desirably be made of asbestos or the like, on which are supported the metal contact rings 104 and 105 which are connected with a heating unit 106, contained within roll 80, by means of the contact terminals 110 and 112 respectively and the leads 114 and 116 respectively. Resting on contact rings 104 and 105 are the wiping contacts 114 and 115 (Figure 3), which are supported by the insulating bracket 122 supported by said member 84, said wiping contacts being connected respectively to the flexible conductors 123 and 124 which are connected to the opposite sides of a rheostat 122, shown diagrammatically in Figure 5, connected to a source of supply through the leads 130 controlled by the line switch 132.

The heat transmitted from flange 88a of the sealing roll 88 to the overlapped margins of the wrapping material W (see Figure 6), is to cause said overlapped margins to adhere and be sealed together, as is well understood, thus forming an elongated travelling closure or envelope W surrounding the discharge end 70 of the tube, so that the strip of material 10 is discharged from the tube into a traveling envelope W of wrapping material.

The elongated package thus formed comprising material 10 encased in its envelope of wrapping material W passes between pressure rolls 88 and 100 which are preferably rubber covered and are adjustably mounted as will be described, for movement to regulate the pressure exerted on the material 10 and its wrapping. The pressure rolls engage and continuously draw the lengths of materials 10 and W from their sources through the wrapping step and deliver them as a wrapped package comprising in cross section a thin member wrapped in an endless flattened ring. After passing between rolls 88 and 100 the elongated package is preferably cut into desired lengths, each of which may be wound on a support 136, which, for light materials, may be a sheet of cardboard. Projecting from the top of upright 32 is a split spindle 136 between the spring-like ends of which the support 134 may be inserted and held while the spindle is rotated, as for example by means of the friction clutch 138 mounted on said spindle 136 and driven by a belt 140 from a pulley 142 mounted on shaft 144 rotatably supported in
2,628,464. 5 w bearings t45 supported on table top extension 308. On shaft 44 are also mounted pressure roll 100, and pulley 146 which is driven through belt 148 from a pulley comprising a fixed clutch member 150 adapted to be engaged by a slideable clutch member 162. Since the particular clutch mechanism is well known and constitutes no part of this invention it will not be described in detail but the said clutch members are shown mounted on shaft 154 extending between the sides of an enclosure 160 supported under the table top extension 308 on frame member 151. Clutch member 152 is slideable on shaft 154 by the operation of the control handle 156 the lower end of which is shown hingedly connected at 198 on the inside of said clutch enclosure 160. Clutch pulley 152 is rotatably as well as slideably mounted on shaft 154 and is driven by an extensible belt 162 from the drive pulley 164 of speed regulator 166 which in turn is driven by shaft 168 from motor 170. Speed regulator 166 and motor 170 are shown mounted on platform 172 which is supported on inverted channel member 174 which in turn is mounted for movement in a horizontal plane on guide rods 176 which are supported by the brackets 180 and 182 which rest on the frame cross support means 184 extending between said said table legs 141. Extending through bracket 180 and rotatably supported thereby is an externally threaded adjustment screw 186 which extends through the bent down end 174 of the inverted channel member 174 and engages the internally threaded bore 186 extending through said end 174 and its inwardly projecting boss 174. At its outer end screw 186 has the hand wheel 190 by which the screw may be rotated to move platform 174 toward or away from the pulley 152 thereby shortening or lengthening belt 162 and thereby raising or lowering the belt in the grooves of pulleys 164 and 152 respectively and correspondingly increasing or decreasing the speed of rotation of the belt in a well known manner whereby controlling the speed of rotation of pressure roll 100 which in turn controls the speed of rotation of roll 98 through frictional contact. It will be understood that regulation of the rate of rotation of the pressure rolls 98 and 100 will result in a synchronic change in the speed of travel of material 10 and its wrapping W and in the speed of rotation of spindle 136 and the winder and support 34 mounted thereon.

After leaving the pressure rolls 98 and 100 the leading end of the package comprising the length of material 10 and the wrapping envelope W is secured in any desired way, for example by a piece of adhesive tape 152, see Figure 6, to the said support 34 which is mounted on spindle 136 and revolved therewith until a winding of predetermined length is obtained. In order to facilitate obtaining wound packages of uniform length the material 10 or the wrapping W may be initially marked at desired intervals. If cellulose or a similar transparent material is used for the wraping marks made on material 10 will be visible through the wrapping as indicated at m in Figure 6. If the cutting operation is performed by hand the operator may sever each length after the greater part of the length has been wound upon a support 34. He then immediately attaches the leading end of the un severed package to another support 154 and substitutes the latter on spindle 136 for the support on which the preceding and now severed length is wound. As stated above pressure roll 100 is mounted on shaft 144 rotatably supported in bearings 145 supported on table top extension 308. Roll 98 is adjustably mounted for movement toward or away from roll 100 in a vertical plane being mounted on shaft 194 suspended from bearings 196 and 198 supported from cross frame member 200 which in turn is supported on the upright frame members 202 and 204. The bearings 196 and 198 are fixed to the lower ends of rods 206 and 208 respectively at the upper ends of which are threadedly engaged in the cup-shaped bearings 210 and 212 which are fixed to and project from the under surface of said cross member 200. Member 208 is pivotally mounted by a vertical pivot 214 on the bracket 216 secured to the upright support member 202 and may be moved in a horizontal plane to give access to the roll 100. The opposite end of said support member 200 is provided with a thumb screw 216 adapted to engage with a bracket 220 mounted on the upright support member 204 for securing the cross support member 200 in position with roll 98 in operative relation to roll 100. While member 20 has for convenience been referred to hereina as a tube-like member or tube it will be understood that it does not have to be endless in cross section or unitary, its function being to provide a shield or form around which the length W may be wrapped to form a wrapper endless in cross section and tubular, encasing the length of material 10.

The method disclosed herein may be performed by various structures as well as manually. It has the advantage of flexibility in being applicable to a wide variety of materials, and to lengths differing widely in size and shape.

It will thus be seen that there has been provided by this invention an apparatus in which the various objects hereinabefore set forth together with many thoroughly practical advantages are successfully achieved. As various possible embodiments might be made of the mechanical features of the above invention and as the art herein described might be varied in various parts, all without departing from the scope of the invention, it is to be understood that all matter hereinafter set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

What we claim is:

Apparatus for encasing a running length of lace or the like in open width with a second continuous length of material such as paper in open width, which comprises, a base, a plurality of channel forming plates secured on said base in a parallel relation to form a channel of desired width and height having the base as its bottom and said plates as its sides, a tube-like member having a cross section of less height than width, said tube-like member comprising a plurality of angularly related portions including a portion extending longitudinally within said channel but spaced from the bottom and sides of said channel, and means for supporting said tube-like member, the other portion of said tube extending upwardly from said channel, means for leading a continuous length of lace or the like into said upwardly extending portion of said tube and through the portion so positioned within said channel, means for supplying a second length of material in open width and feeding it between said tube-like member and said channel with its longitudinal central portion in said channel and its lateral sides turned angularly with respect to said central portion by the sides of the channel respectively, contact members extending across said channel.
from opposite sides to fold said turned lateral margins toward one another around said tube-like member, means for securing together said folded over margins to form an envelope, and means for continuously advancing said lengths to cause said length of lace or the like to be continuously advanced through said tube-like member into said envelope formed from said second length of material, whereby there is produced a continuous travelling elongated package comprising said length of lace or the like in open width encased in a continuous envelope formed from said second length of material.

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