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J. W. CHALMERS

MANUFACTURING WRAPPER BLANKS

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Fig. 1.

Fig. 2.

Fig. 4.

John H. Chalmers

Notor, Col., Grindle Notar
UNITED STATES PATENT OFFICE

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MANUFACTURING WRAPPER BLANKS


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This invention is for improvements in or relating to machines for manufacturing blanks and if desired for wrapping block shaped articles therein, for example, the article may be composed of a wrapped or unwrapped batch of cigarettes or other goods.

Generally such block shaped articles are of substantially rectangular shape and are relatively narrow or thin in one dimension as are the ordinary cigarette packets or packages containing the cigarettes in two or three rows, but although the invention is particularly applicable to such thin block shaped articles it can be applied to articles which are more nearly cubic in form.

It is common, for example, to wrap cigarette packets in an outer wrapper which wrapper is frequently of tough material, for example, the transparent cellulose derivatives commonly employed for this purpose, so that sometimes difficulty is experienced in opening such wrappers or removing them from the article about which they are wrapped.

The most popular forms of cigarette packing are the slide and shell type of carton made of thin cardboard such as is largely used in Great Britain, and the "paper package" such as is largely used particularly in the United States of America. In the former case an outer wrapper is entirely stripped before the carton is opened, so the disposition of the closure folds of the outer wrapper relatively to the carton is not of much importance. In the latter case, however, it is usually desired to retain the outer wrapper in position about the package while the cigarettes are being consumed and therefore the wrapping may be so disposed about the package that the opening of the wrapper is effected at the end adjacent to the mouth of the package.

Block shaped articles are commonly enclosed in a wrapping of the type in which a wrapper is folded completely to enclose an article and in which the wrapper when partly folded extends beyond a face of the article on to which face the extensions are folded from three adjacent sides of said face. The portion first folded on to the said face from those three sides is called hereinafter the "middle flap." The other two portions when folded down are called hereinafter the "other flaps."

It will be seen that this type includes both the common kinds of wrapping used on cigarette packets, namely, the block ended type described in British Patent No. 255,897 and the double ended type in which the wrapper is folded round two pairs of opposed faces while the remaining two opposed faces are covered by folding down those portions of the wrapper which project beyond the respective planes of the said opposed faces from the four sides of such faces.

To provide means whereby such wrappings may be torn open and wholly or partly stripped from the article enclosed, the wrapper blank is provided with a tab adhesively secured to the blank, said tab consisting of a strip of material extending beyond the side of the blank (e.g. at right angles). The tab is so located on the blank that when the latter is folded about the article the tab lies on a middle flap. Such a blank will be referred to hereinafter as "the said blank."

According to the invention there is provided a machine for manufacturing the said blanks, comprising means for feeding a web of wrapping material, means for applying pieces of material to the web at spaced intervals to constitute the aforesaid tabs and securing said pieces to the web by adhesive and means for thereafter severing blanks from the web.

According to the invention there is also provided a machine as set forth in the preceding paragraph, wherein means are provided for folding over the projecting portion of the adhesive tab so that it lies in contact with the blank which may thereafter be manipulated as a simple rectangular blank.

Further, according to the invention there is provided a machine as set forth in either of the preceding paragraphs, comprising wrapping mechanism adapted to fold the said blank around an article in such manner that an extension lies on a middle flap and beneath the other flaps with its free end projecting externally of such other flaps.

One way of carrying out the invention will now be described by way of example with reference to the accompanying drawings in which—

Figure 1 is a wrapper blank.

Figure 2 shows the blank folded about a packet.

Figure 3 is a side elevation of a machine for making the wrapper blanks and for folding them about the packets.

Figure 4 shows mechanism for applying tabs to the web of material from which the wrapper blanks are formed.

Like reference numerals refer to like parts throughout the several figures of the drawings.

In Figure 1 the wrapper blank 1 is shown flat, the dotted lines 2 indicating the lines about

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which the blank is to be folded. A tab 3 is shown secured to the middle flap 4, but the part 5 is shown as folded back over the blank. Figure 2 shows the blank folded about a packet of cigarettes and shows the closed end of the tab 3 extending from the middle flap 4 and from beneath the overlying flaps 6 and 7.

The wrapper blanks are made from a web of wrapping material 8 fed from a reel 9, see Figure 4.

The reel 9 is controlled by a brake or equivalent device 10 so that the web 8 being fed is reasonably taut and as it is unwound first passes into mechanism adapted to apply the tabs 3. The manufacture and application of such tabs can be effected in numerous ways, but in the construction shown the tabs are made by securing pieces from a web of material 11 of a suitable width, which is also fed from a reel 12.

The web 8 of wrapping material is fed between an engraved roller 13 which is provided on its cylindrical surface with an intaglio engraving of a determined depth and is adapted to impress upon a rectangular formation of a dimension equal to the size of the portion of the tab to be secured to the web 8. Adapted to bear upon the surface of the roller 13 is a doctor blade 14 which is preferably arranged to reciprocate over the surface thereof. The roller 13 is adapted to receive a supply of adhesive (which in the case of cellulose webs and tabs may be a cellulose solvent), from a bath 15 by means of a roller 16 which is carried by a swiveling bracket 17 and pressed into engagement with the roller 13 by means of a tension spring 18. The roller 13 is adapted to dip into the bath 15 and is rotatable therein, due to friction, by the roller 13. Mounted above the roller 13 is a pressure roller 19 carried by a arm and so arranged that these rollers may be rocked laterally on a pin 21. The second arm 22 of the lever is connected to a spring 23 which tends to hold the pressure roller 19 in contact with the engraved roller 13. The arm 20 which carries the pressure roller 19 is preferably provided with an extension 24 which is adapted to engage with a cam 25 mounted on one face of the engraved roller 13. The extension of the arm 20 co-operates with the cam secured to the roller 13 to periodically move the pressure roller 19 away from the engraved roller 13 and so permit the web of wrapping material to move out of contact with the engraved roller 13 to avoid any tendency of the material to stick thereto due to imperfect doctoring.

The web 8 extends from the roller 13 around a roller 24 so as to bring the surface of the web which engages with the roller 13 uppermost and also to locate it in the tangential plane common to the rollers 24, 26 and 28, and the edges of the fixed and rotary blades 27 and 28 of a rotary cutter of the feed for the web 11.

This feed comprises a pair of feed rollers 25 and 26 of which 25 is positively driven so as to feed the web 11 towards a rotary cutting mechanism, at a speed slower than the speed of the web 8.

Mounted above the roller 24 is a gripping roller 130 which is positively driven at the speed of the web 8 and is provided with a flattened face 131 which is adapted to periodically grip the leading edge of the web 11 and press it upon the web 8. The rollers 24 and 26 are adapted to be moved out of engagement with the rollers 130 and 28 so as to allow new webs 8 and 11 to be placed into position and adjusted. The roller 24 is carried upon one arm 31 of a lever adapted to pivot about a pin 32 and a spring 33 normally tends to hold the roller 24 in engagement with the roller 130.

An adjustable stop 34 is provided to limit the movement of the roller 24 towards the gripping roller 130. Secured to the arm 31 so as to form an extension thereof is an arm 35 which is adapted to engage, through an adjustable pin 36 with one arm 37 of a lever pivoted about a pin 38 and carrying at its free end the roller 26.

An arm 38 which carries the arms 31 and 35 is adapted to be moved to the left against the influence of the spring 33 and in so doing the roller 24 is moved out of engagement with the roller 130 and the pin engages with the arm 37 and moves the roller 26 out of engagement with the roller 25.

Thus it will be seen that in operation the travelling web 8 of wrapping material passes between the rollers 12 and 25 the roller 13 having an intaglio engraving of a definite depth formed thereon a definite quantity of adhesive is applied to the web at regular intervals along its length.

The web passes from the roller 13 over the roller 24 where the gummed face of the web is turned uppermost, and as the leading edge of the gummed portion moves into proximity with the flattened face of the gripping roller 130 the leading edge of the web 11 registers with the leading edge of the gummed portion of the web 8 and the end portion of the flattened face of the gripping roller 130 grips the leading edge of the web 11 and presses it into engagement with the web 8, whereupon the cutting mechanism simultaneously severs a tab 3 from the travelling web 11.

The rotary cutter is arranged to make one revolution (i.e. one cut) for each tab 3 being wrapped in the scoring operation of the table, all liability of the tab 3 being moved relatively to the web of wrapping material is obviated.

The web of wrapping material 8 with the freshly applied tabs is then passed between rollers 40, 41 to consolidate the adhesive joint, after which the web passes along in contact with a hot plate 42. The plate is of such dimensions and temperature that the adhesive is properly dried at the position where the web moves out of contact with the hot plate. The web and plate are so disposed that the side of the web 8 (i.e. the side opposite that on which the tabs 3 are stuck) is in contact with the plate, the web being pressed against the plate by an endless band 43 travelling at the same speed as the web.

The web next passes into a scoring or creasing device whose function is to control the scoring (according to the nature of the wrapping material) the tab in line with that side of the wrapper web from which the tab projects. The device consists of a pair of rollers 43, 44, the one 44 being the male and consisting of a metal roller with a suitably disposed male scoring member. The other roller 43 is the female and may be a plain rubber covered roller. Associated with the scoring rollers is a folding
device 45 of any suitable kind (e. g. a double ploughshare folder) which folds the overhanging portion of the tab 4 vertically upwards about the score or crease and thereafter folds it through a further 90° angle until it lies on the upper face of the web. The web carrying the folded tabs next passes over guide rollers 46 and 47 and then between a pair of rollers 48 which "iron" down the fold so that the tab is in close contact with the web, and for all practical purposes involved in wrapping the article the web may be regarded as a plain web. In order to ensure that the folded extension remains in the "ironed" down position during handling by the wrapping mechanism the contacting portions of the web and folded part of the tab may be slightly wetted when cellulose derivative wrapping material is used. By this means there is secured a temporary adhesion between the two portions of material sufficient in fact to retain the folded extension in position until the wrapping operation is finished.

The web of wrapping material next passes into the feed rollers 50 and 51 of the wrapping mechanism. If a block ended wrapping is desired, such mechanism of the well known type where the articles 52 to be wrapped are carried in succession along a machine bed 53 by pusher pieces 54 on a conveyor 55 or similar device. The web of material is fed across the path of the articles 52, for example it is fed down through a slot formed by the guides 56, 57 in the machine bed and as an article 52 moves into engagement with the web the latter is severed by a cutting device comprising a rotary knife 58 and a fixed knife 59, to provide a wrapper blank of the necessary size. The web is so arranged relatively to the contacting article that the surface to which the tab has been secured by an adhesive is facing the article. The continued movement of the article causes the blank to be folded into a U about the article and the various parts of the mechanism are so timed that the tab constitutes part of the base of the U. The folding operations take place in the usual well known sequence and the free end of the tab (now folded down) lies on the adjoining middle flap and projects from beneath the corresponding other flaps as may be seen in Figure 2. In the case of a double ended wrapping the first operation consists in folding the blank into a U as outlined above, after which the extremities of the limbs of the U are brought into contact and sealed to form a tubular wrapper about the article. The subsequent folding of the middle flaps and the other flaps then takes place as in the previous example.

In order to facilitate the tearing action initiated by the tab the blank may have short slits 490 in its side forming continuations of the edges of the tab. The machine may have means provided for making such slits, preferably operating at a time after the corresponding tab has been secured to the web. For example, the ironing rollers may embody knives 49 extending for the required distance along their peripheries and parallel to their axes, or in the case where the female roller is of rubber, the upper roller alone may be provided with knives. Alternatively, a further pair of rollers may be provided to effect the slitting operation.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a wrapping machine, means for feeding a web of wrapping material, means for applying and securing tabs to said web at predetermined intervals, said tabs projecting in part beyond a longitudinal edge of the web, means to fold said projecting parts of the tabs against the web, and means to sever a blank containing a tab from said web.

2. In a wrapping machine, means for feeding a web of wrapping material, means to apply adhesive to said web at predetermined intervals at positions adjacent a longitudinal edge of the web, means to apply tabs to the web at the positions to which adhesive has been applied, said tabs projecting in part beyond that longitudinal edge of the web adjacent to which the adhesive is applied, means to fold said projecting parts of the tabs against the web, and means to sever a blank containing a tab from said web.

3. In a wrapping machine, means for feeding a web of wrapping material, means for applying and securing tabs to said web at predetermined intervals, said tabs projecting in part beyond a longitudinal edge of the web, means to fold said projecting parts of the tabs against the web, means to provide tear starting slits in said web, slits being located adjacent to said tabs and extending into the web from that edge thereof which is adjacent the tabs, and means to sever a blank containing a tab from said web.

4. In a wrapping machine, means for feeding a web of wrapping material, means to apply adhesive to said web at predetermined intervals at positions adjacent a longitudinal edge of the web, means to apply tabs to the web at the position to which adhesive has been applied, said tabs projecting in part beyond that longitudinal edge of the web, means to apply tabs to the web at the positions to which adhesive has been applied, said tabs projecting in part beyond that longitudinal edge of the web adjacent to which the adhesive is applied, means to fold said projecting parts of the tabs against the web, means to provide tear starting slits in said web, said slits being located adjacent to said tabs and extending into the web from that edge thereof which is adjacent the tabs, and means to sever a blank containing a tab from said web.

5. In a wrapping machine, means for feeding a web of wrapping material, means for applying and securing tabs to said web at predetermined intervals, said tabs projecting in part beyond a longitudinal edge of the web, means to fold said projecting parts of the tabs against the web, means to apply a damping agent to the free portion of the tab to provide temporary adhesion between said portion and the web, and means to sever a blank containing a tab from said web.

6. In a wrapping machine, means for feeding a web of wrapping material, means to apply adhesive to said web at predetermined intervals at positions adjacent a longitudinal edge of the web, means to apply tabs to the web at the positions to which adhesive has been applied, said tabs projecting in part beyond that longitudinal edge of the web adjacent to which the adhesive is applied, means to fold said projecting parts of the tabs against the web, means to apply a damping agent to the free portion of the tab to provide temporary adhesion between said free portion and the web, and means to sever a blank containing a tab from said web.

7. In a wrapping machine, means for feeding a web of wrapping material, means for applying and securing tabs to said web at predetermined
4. 2,288,474 intervals, said tabs projecting in part beyond a longitudinal edge of the web, means to fold said projecting parts of the tabs against the web, means to apply a damping agent to the free portion of the tab to provide temporary adhesion between said free portion and the web, means to provide tear starting slits in said web, said slits being located adjacent to said tabs and extending into the web from that edge thereof which is adjacent the tabs, and means to sever a blank containing a tab from said web.

5. In a wrapping machine, means for feeding a web of wrapping material, means for applying and securing tabs to said web at predetermined intervals, said tabs projecting in part beyond a longitudinal edge of the web, means to create said tabs along a line substantially parallel with and in alignment with that longitudinal edge of the web adjacent said tabs, means to fold said projecting parts of the tabs about said crease and against the web, and means to sever a blank containing a tab from said web.

6. In a wrapping machine, means for feeding a web of wrapping material, means for applying and securing tabs to said web at predetermined intervals, said tabs projecting in part beyond a longitudinal edge of the web, means to create said tabs along a line substantially parallel with and in alignment with that longitudinal edge of the web adjacent said tabs, means to fold said projecting parts of the tabs about said crease and against the web, and means to sever a blank containing a tab from said web.

JOHN WALKER CHALMERS.