

PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Dispensers for Labels and the like

I, KENNETH BURBIDGE, a British subject of 81, Townsend Road, Miramar, Wellington, New Zealand, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to dispensers for articles, such as labels, preferably self-adhering labels, carried by a backing tape, which can be removed readily from the tape on which they are conveyed for adherence to other articles. With such arrangements the controlled feeding of the backing tape conveying the articles must be effected and various elements may be incorporated into the dispenser for various requirements, such as a magazine or the like for holding a reel of backing tape, or additional guide rollers or plates, or the like for guiding the feed of the tape in order that varying or specific processes may be carried out such as label dispensing or delivery at a given point. The main problem to be overcome by the dispenser of the present invention is the prevention of crumpling, looping or feed back of the tape. The tape is fed through the machine by a repetitive sequence of movements upon actuation of the dispenser, whereby the tape is held or clamped to a moving component, said moving component moved in one direction and halted, the tape held or retained in a stationary guiding component and released from the moving component, the moving component being returned to its first position to a new position on the tape and the cycle can then be repeated. At some stage in this cycle of operation the free end of the tape is being impelled through an open clamp, or a relative movement between the tape and clamp is taking place. In the case

of non-rigid tapes, this could result in crumpling, looping or feed back of the tape and the desired forward movement of the tape would not be effected or obtained since the moving components would fail to change correctly its position on the tape.

Accordingly the present invention provides a dispenser for articles, such as labels, carried by a backing tape, comprising a peeling blade around which the tape is arranged to be bent, such that the articles are peeled and spill from the tape as the tape passes over the edge of the blade, first and second gripping means through which and between which the tape is arranged to be threaded, whereby actuation of the dispenser causes the first gripping means to close and grip the tape and draw the tape therewith in one direction over and from the blade and the second gripping means remains open and allows the tape to pass therethrough in said one direction and subsequently said second gripping means closes to grip the tape and the first gripping means opens and moves over the tape in the opposite direction to take up a new position on the tape without crumpling or damaging the tape.

Complementary holding surfaces are provided on the gripping means, which provides adequate rigidity over the length of the tape between the gripping means, and the tape can be impelled through the gripping means and the gripping means passed over the tape without fouling the tape or causing detrimental crumpling or looping of the tape. The complementary or opposing holding surfaces of the gripping means may be suitably shaped such that the tape passing therethrough is shaped in a complementary fashion. For example the tape may be given a curved, or corrugated cross-section or given a channel cross-section. Any cross-sectional shape may

[Price 4s. 6d.]

be given to the tape by the gripping means provided it gives the tape sufficient rigidity to be impelled through and between the gripping means upon actuation of the dispenser. In one arrangement of the invention it is envisaged that the gripping means be formed with circular holding surfaces by two plugs having circular outer surfaces such as a circular tapered outer surface and located on a central aligning rod, the plugs each being positioned in a clamp formed in this arrangement by a collar, the apertures in the collars being likewise circular, a gripping effect being provided between the plugs and the collars whereby the tape passing through the collars is curved in cross-section and given rigidity as it is passed therethrough.

Furthermore one of the plugs may be formed integral with or fixed to the central aligning rod or the two plugs may be movable along the rod or the end of the central aligning rod may be tapered and replace one of the tapered plugs.

An alternative form of collar or clamp is envisaged suitable for facilitating "threading-up" of the tape, in which a slot or gap or gate is provided through the walls of the collars enabling the tape to be passed edgewise through the slot, gap or gate and around the plug. Thus the gap or slot may be provided with a spring-closed or weight-closed gate. Alternatively a gate may be provided closed in position by a clip. This gap or gate may be of any desired width and it is envisaged that if of extreme width it could extend around half or more of the collar and plug.

Other gripping means are envisaged for providing adequate rigidity to the tape, whereby the tape is fed between suitable forming or holding surfaces on the gripping means which surfaces may form all or part of the profile of these gripping means. A simple example is a rod within a tube whereby the tape is provided with a circular cross-section as it passes between the outer surface of the rod and the inner surface of the tube.

One or both of the clamps of the two gripping means may be self-releasing, the clamp of the stationary gripping means may however be lightly holding and non-releasing.

Such a self-releasing clamp may take the form of a pivoted jaw, which by pivotal movement relative to its respective plug provided therein, closes into contact with the plug to grip the tape therebetween. The frictional relative movement of the jaw or plug against the tape is sufficient to cause the closing or releasing action of the clamp.

Thus the dispenser of the invention is so arranged that the gripping and releasing movement of the gripping means is effected by the slight initial free movement of the tape through the gripping means, causing the movable plug member or hinged plug mem-

ber, in contact against the tape to be drawn or driven along the tape, tightly into the aperture of the collar or clamp thereby effecting the grip, the subsequent reverse movement of the tape effecting the release by causing the slackening of the plug member from within the aperture.

The opposing components of the gripping means may have shape-forming surfaces. These surfaces may be designed to have a crimping effect on the tape, or a penetrating effect.

The dispenser may be designed so that the length of the stroke may be regulated and set by means of movable stops, and the settings capable of fine adjustment by means of set screws, or the like.

All leading-in edges may be bevelled back or splayed to ensure easy insertion of tapes and smooth running.

A preferred embodiment of the invention is illustrated in the accompanying drawings in which:

Figure 1 is a side view of the dispenser of the present invention,

Figure 2 is an underneath view of the dispenser of Figure 1,

Figure 3 is an end elevation of the dispenser of Figures 1-2.

Referring to the drawings, the dispensing machine comprises a frame 1 having a magazine 3, for a roll 6 of tape 4, the tape 4 (shown in dotted lines) providing a backing for tape conveyed articles 5. By applying tension to the end of the tape 4 it will unwind from the roll 6 to provide continuous feed of the tape 4 from the magazine 3.

From the magazine 3 the tape is fed beneath a guide surface 7 and then over a peeling blade 8. The guide surface, which may form part of the magazine or consist of a separate guide member, may be curved. The guide surface 7 may be replaced by a flat plate underneath which the tape is fed to the blade 8. Alternatively, the tape may be fed directly to the blade without guide means or may be fed over a guide roll or other guiding surface to approach the blade 8 flat. The blade 8 is suitably provided suspended from the frame 1 having a free end facilitating easy threading-up of the tape thereover.

The tape then alters direction immediately after passing over the blade 8.

A slidable member or plunger 9 is provided slidably mounted on the frame 1 and further attached thereto by a return spring 10.

A fixed collar 11 is provided attached to or extending from the frame 1 having an aperture 12 therein.

A further collar 13 is provided extending from the plunger 9, having an aperture 14 therein, the apertures 12, 14 being in alignment one with another adjacent frame 1.

After passing over and around the blade

8, the tape 4 is fed through the apertures 12, 14 in the two collars, 11, 13, and thereafter it is free to move away from the dispenser where it can be torn off when the length becomes unmanageable and unwieldy, or alternatively, rewound if desired.

The collars 11, 13 are suitably formed as shown in this arrangement by a wire or member adaptable to being profiled to encircle plugs 16A, 16B to grip the tape 4 therebetween and have stops 24, 25, attached thereto or integral therewith. Such a collar may be moulded or worked into this shape in any suitable material.

The configuration shown assists greatly in edgewise threading of the tape into the collars. If it is desired to have end-threading of the tape into the machine the leading edges of the collars may be bevelled or splayed back for the purpose of deflecting the end of the tape during initial threading-up of the machine, through and into the collars. Furthermore, with this end-threading arrangement, the stops for retaining the plugs may be movable pawls which, when disengaged, permit the greater withdrawal of the plugs from within the collars providing greater clearance all round for threading of the tape.

The plugs 16A, 16B are provided on an aligning rod 15 of circular cross-section which is of a length to extend through the plugs 16A, 16B which are tapered co-operating with the openings 12, 14 respectively of each collar 11, 13. The rod 15 is held in position only by virtue of the co-operation of the plugs 16A, 16B provided thereon in the openings 12, 14 respectively of each collar 11, 13. Plug 16B is provided with a bore therethrough to facilitate its mounting on rod 15, the bore being of a size to allow free movement of the plug 16B on the rod 15 sufficient to cause the plug 16B to move relative to the rod 15 or vice versa when either is prevented from movement itself. The fixed collar 11 engages the plug 16A which is fixed on the rod in this arrangement.

Alternatively it may be formed as part of the rod.

Movement of both plugs 16A, 16B within the collars 11, 13 is possible but limited toward the stops 24, 25 in that an abutting surface is provided on each plug engageable with the stops 24, 25. In this particular arrangement the larger end face of each plug forms the abutting surfaces. With a plug formed as part of the surface of the rod a suitable recess in the rod need be provided to engage the stops. This ensures limited movement of the plugs 16A, 16B relative to the collars 11, 13 sufficient to release the grip on the tape.

Movement of the plugs in the other direction away from the stops 24, 25 is limited by contact of the major diameters of the plugs in their respective collars 11, 13.

The slidable member or plunger 9 is arranged to slide to and fro within the frame 1. The movement in one direction may be effected manually by the person using the dispenser and movement in the other direction is effected upon release of the sliding member 9 under action of the return spring 10. A convenient lever, lug or handle member 21 is provided for actuation of the sliding member 9. A further handle or gripping member 22 is likewise provided attached to the frame 1 in order to facilitate the pulling of the slidable member 9 and holding of the dispenser whereby the thumb may movably engage the handle 21 and the rest of the hand grip the handle 22 in a very convenient manner.

The backing tape 4, with the articles 5 adhered thereto passes from the magazine 3 beneath the guide surface 7 and over the peeling blade 8 and through the aperture 12 in the collar 11 which is fixed to the frame 1 and through the aperture 14 in the collar 13 attached to plunger 9, the tape being warped when it passes round the plugs 16A, 16B within the collars and along the rod between the collars 11, 13. The tape 4 is substantially flat in cross-section between the magazine 3 and blade 8 and until it is warped into a rigid shape between the collars and plugs.

To proceed to dispense the tape-conveyed articles 5, which for convenience we will call "labels" hereinafter, the sliding member 9 is moved in one direction against the return spring 10 by actuation of the handle 21. This causes the movable collar 13 to move in said one direction to contact the major diameter of the plug 16B drawing the plug 16B therewith and at the same time gripping the tape 4 between the tapered surface of the plug 16B and the collar 13.

The movable collar 13 draws the plug 16B over the rod 15 until the movement of the slidable member 9 stops. The length of the stroke or movement of the plunger 9 in said one direction is limited by a set screw 30 the end of which is arranged to contact a portion of the plunger after a predetermined movement of the plunger 9. The set screw may be adjusted to vary the stroke according to the length of labels to be dispensed.

The tape 4 is pulled in said one direction with the collar 13 and plug 16B, thus withdrawing a supply of tape 4 from the magazine 3 and drawing the tape 4 over the peeling blade 8. At the same time, the fixed plug 16A except for its warping effect has a neutral effect on the tape, in other words the tape 4 is not gripped and is free to pass through the fixed collar 11.

The labels 5 are of the type temporarily adhered to the tape 4 by means of contact adhesive, the surface of the tape 4 being such as to prevent permanent adhesion between

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itself and the labels 5, whereby the labels 5 may be removed without difficulty. It is merely necessary to lift the edge of the label 5 and peel the label 5 from the tape 4. In the embodiment shown the tension on the tape 4 provided by the gripping movement of the movable collar 13 tears back the tape 4 from beneath the forward edge of the label 5 as the label 5 approaches the forward edge of the peeling blade 8, whereby the label 5 continues in its line of movement and leaves the tape.

At this stage the leading end of the subsequent label 5 on the tape 4 is approaching the peeling blade 8. Upon release of the plunger 9 the return spring 10 draws the plunger 9 back into its initial position, thus allowing the movable collar 13 to slide back toward the leading end of the rod 15 thus releasing its gripping effect on the plug 16B and thus on the tape 4, and to slide over the tape to take up a new position thereon.

At the same time the fixed collar 11 closes onto the plug 16A and grips the tape 4 in response to any feed-back movement of the tape 4.

The stroke of the plunger in said one direction causes the movable collar 13 to move along the tape in a direction away from the peeling blade and as a consequence of this movement and drag exerted on the plug 16B caused by the friction between the tape and plug 16B, the plug 16B is impelled into the aperture of the collar 13 thus providing a gripping or binding action on the tape therebetween and drawing the tape along in said one direction. The fixed collar 11 as mentioned above has no gripping effect on the tape being impelled therethrough apart from the warping effect providing rigidity, since the drag exerted on the plug by the tape passing therethrough tends to draw the plug therewith in said one direction to provide increased clearance between the tapered surface of the plug and the collar. On the return stroke of the plunger 9 there will be a slight amount of reverse movement given to the tape as a consequence of the grip between collar 13 and plug 16B not having been sufficiently released. As a consequence of this slight reverse movement of the tape, the tape is likewise impelled slightly in a reversed direction through fixed collar 11 and the consequent accompanying drag in this reversed direction on the plug 16A of the fixed collar 11 attached to the frame 1 draws plug 16A into and tightens up and grips the tape within the collar 11. As a consequence of the return movement of the collar 13 attached to the plunger 9, the drag on the plug 16B of collar 13 due to the friction between plug 16B and the tape 4 is drawn or impelled out of the collar 13 and its grip on the tape 4 is released, thus allowing it to complete the re-

mainder of its return movement to a new position on tape 4.

A guide plate 23 is provided extending from the guide surface 7 above the blade and to a roller 26 which is suitably provided with a resilient surface such as rubber, foamed rubber etc., the roller being rotatably mounted on the frame 1. Upon dispensing of a label 5, the label 5 passes beneath said guide plate 23 and into contact with the roller with its sticky surface away from the roller, whereby the label 5 can be applied to the surface of an article and the roller provide application pressure for adherence of the label to the article. The position of the roller relative to the peeling blade 8 could be adjustable if desired to accommodate labels of different lengths.

It will be appreciated that various modifications of the arrangements described above are envisaged within the scope of the invention as set forth in the appended claims. For example various forms of gripping members may replace those specifically described above. Furthermore the guiding means and feed-in of the tape to the peeling blade may be varied to accommodate various uses of the dispenser and to feed the labels to various types and shapes of articles to which they are to adhere. Guide means may be provided for guiding the feed of the labels themselves after their separation from the tape to their point of application.

It may be desirable that the tape from which the labels have been released be guided subsequent to passing over the blade into the path of the labels as they are peeled from the blade, such that they again contact the tape from which they have been released and adhere thereto only lightly. Thereafter they may continue be fed with the tape to the point of application by guide means and can thus be applied to articles independently of the stroke of the dispenser.

Furthermore the blade may be provided to the rear or front of the frame or midway therebetween depending upon the application or use of the dispenser and convenience of dispensing.

The actuation of the plunger may be manually or treadle operated.

The feeding of the tape may likewise be down over the blade or up over the blade according to the application of the dispenser desired.

WHAT I CLAIM IS:—

1. A dispenser for articles, such as labels, carried by a backing tape, which comprises a peeling blade around which the tape is arranged to be bent, such that the articles are peeled and spill from the tape as the tape passes over the edge of the blade, first and second gripping means through which and between which the tape is arranged to be



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itself and the labels 5, whereby the labels 5 may be removed without difficulty. It is merely necessary to lift the edge of the label 5 and peel the label 5 from the tape 4. In the embodiment shown the tension on the tape 4 provided by the gripping movement of the movable collar 13 tears back the tape 4 from beneath the forward edge of the label 5 as the label 5 approaches the forward edge of the peeling blade 8, whereby the label 5 continues in its line of movement and leaves the tape.

At this stage the leading end of the subsequent label 5 on the tape 4 is approaching the peeling blade 8. Upon release of the plunger 9 the return spring 10 draws the plunger 9 back into its initial position, thus allowing the movable collar 13 to slide back toward the leading end of the rod 15 thus releasing its gripping effect on the plug 16B and thus on the tape 4, and to slide over the tape to take up a new position thereon.

At the same time the fixed collar 11 closes onto the plug 16A and grips the tape 4 in response to any feed-back movement of the tape 4.

The stroke of the plunger in said one direction causes the movable collar 13 to move along the tape in a direction away from the peeling blade and as a consequence of this movement and drag exerted on the plug 16B caused by the friction between the tape and plug 16B, the plug 16B is impelled into the aperture of the collar 13 thus providing a gripping or binding action on the tape therebetween and drawing the tape along in said one direction. The fixed collar 11 as mentioned above has no gripping effect on the tape being impelled therethrough apart from the warping effect providing rigidity, since the drag exerted on the plug by the tape passing therethrough tends to draw the plug therewith in said one direction to provide increased clearance between the tapered surface of the plug and the collar. On the return stroke of the plunger 9 there will be a slight amount of reverse movement given to the tape as a consequence of the grip between collar 13 and plug 16B not having been sufficiently released. As a consequence of this slight reverse movement of the tape, the tape is likewise impelled slightly in a reversed direction through fixed collar 11 and the consequent accompanying drag in this reversed direction on the plug 16A of the fixed collar 11 attached to the frame 1 draws plug 16A into and tightens up and grips the tape within the collar 11. As a consequence of the return movement of the collar 13 attached to the plunger 9, the drag on the plug 16B of collar 13 due to the friction between plug 16B and the tape 4 is drawn or impelled out of the collar 13 and its grip on the tape 4 is released, thus allowing it to complete the re-

mainder of its return movement to a new position on tape 4.

A guide plate 23 is provided extending from the guide surface 7 above the blade and to a roller 26 which is suitably provided with a resilient surface such as rubber, foamed rubber etc., the roller being rotatably mounted on the frame 1. Upon dispensing of a label 5, the label 5 passes beneath said guide plate 23 and into contact with the roller with its sticky surface away from the roller, whereby the label 5 can be applied to the surface of an article and the roller provide application pressure for adherence of the label to the article. The position of the roller relative to the peeling blade 8 could be adjustable if desired to accommodate labels of different lengths.

It will be appreciated that various modifications of the arrangements described above are envisaged within the scope of the invention as set forth in the appended claims. For example various forms of gripping members may replace those specifically described above. Furthermore the guiding means and feed-in of the tape to the peeling blade may be varied to accommodate various uses of the dispenser and to feed the labels to various types and shapes of articles to which they are to adhere. Guide means may be provided for guiding the feed of the labels themselves after their separation from the tape to their point of application.

It may be desirable that the tape from which the labels have been released be guided subsequent to passing over the blade into the path of the labels as they are peeled from the blade, such that they again contact the tape from which they have been released and adhere thereto only lightly. Thereafter they may continue be fed with the tape to the point of application by guide means and can thus be applied to articles independently of the stroke of the dispenser.

Furthermore the blade may be provided to the rear or front of the frame or midway therebetween depending upon the application or use of the dispenser and convenience of dispensing.

The actuation of the plunger may be manually or treadle operated.

The feeding of the tape may likewise be down over the blade or up over the blade according to the application of the dispenser desired.

WHAT I CLAIM IS:—

1. A dispenser for articles, such as labels, carried by a backing tape, which comprises a peeling blade around which the tape is arranged to be bent, such that the articles are peeled and spill from the tape as the tape passes over the edge of the blade, first and second gripping means through which and between which the tape is arranged to be



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threaded, whereby actuation of the dispenser causes the first gripping means to close and grip the tape and draw the tape therewith in one direction over and from the blade and the second gripping means remains open and allows the tape to pass therethrough in said one direction and subsequently said second gripping means closes to grip the tape and the first gripping means opens and moves over the tape in the opposite direction to take up a new position on the tape without crumpling or damaging the tape.

2. A dispenser as claimed in claim 1, in which the first and second gripping means have opposing holding surfaces of such configuration as to provide the portion of the tape upon which the gripping means are acting with a cross-section providing rigidity to said portion of the tape and thus prevent detrimental crumpling and looping of said portion of the tape as the first gripping means when open moves over the tape to take up its new position on the tape.

3. A dispenser as claimed in claim 2, in which the opposing holding surfaces of the first and second gripping means provide the portion of the tape gripper therebetween with a curved cross-section.

4. A dispenser as claimed in claim 2, in which the opposing holding surfaces of the first and second gripping means are of corrugated configuration such as to provide the portion of the tape gripped therebetween with a corrugated cross-section.

5. A dispenser as claimed in any one of claims 1, 2 or 3 in which the gripping means each comprise a collar and a tapered plug, the two plugs being provided on an aligning rod, whereby the plugs are reciprocable within the collars in a limited degree to effect gripping and release of the tape between the plugs and collars.

6. A dispenser as claimed in claim 5, in which both of the plugs are reciprocable along the aligning rod to a limited degree.

7. A dispenser as claimed in claim 5, in which one of the plugs is reciprocable along the aligning rod to a limited degree and the other plug is fixed to or integral with the aligning rod.

8. A dispenser as claimed in claim 5, 6 or 7 which includes stop means provided to limit the movement of the plugs within the collars in one direction, movement in the other direction being limited by engagement

of the major diameter of each tapered plug within the associated collar.

9. A dispenser as claimed in any one of claims 5 to 8, which includes a frame onto which the peeling blade is attached, and a slidable member, slidably attached thereto for a to and fro reciprocation relative to the frame, one of the collars being attached to the slidable member and the other being attached to the frame.

10. A dispenser as claimed in claim 9 in which the movement of the slidable member is limited in one direction by an adjustable stop means to coincide with the length of the label to be dispensed and return movement of the slidable member in the other direction is effected by a return spring.

11. A dispenser as claimed in any one of claims 5 to 10, in which the leading edges of the collars are splayed or bevelled to facilitate end threading of the tape through the collars.

12. A dispenser as claimed in any one of claims 5 to 11 in which the collars are formed with a slot or gap therethrough to facilitate edgewise threading of the tape into the collars.

13. A dispenser as claimed in claim 12 in which the slots or gaps are arranged to be closed by clips, gates or the like or weight — or spring — actuated means.

14. A dispenser as claimed in any preceding claim, which includes guide means in front of the peeling blade member to guide the tape to the blade.

15. A dispenser as claimed in claim 14, in which the guide means comprises a guide surface formed on a magazine attached to the frame which magazine is arranged to contain a supply of the backing tape with the labels carried thereon.

16. A dispenser as claimed in claim 14, in which the guide means comprises a guide plate.

17. A dispenser for tape-conveyed articles, such as labels, substantially as hereinbefore described with reference to the accompanying drawings.

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