April 11, 1950 G. K. CHARLES 2,503,470

APPARATUS FOR APPLYING ADHESIVE STRIP TO CYLINDRICAL CANS OR OTHER CONTAINERS

Filed Nov. 25, 1947 3 Sheets-Sheet 1

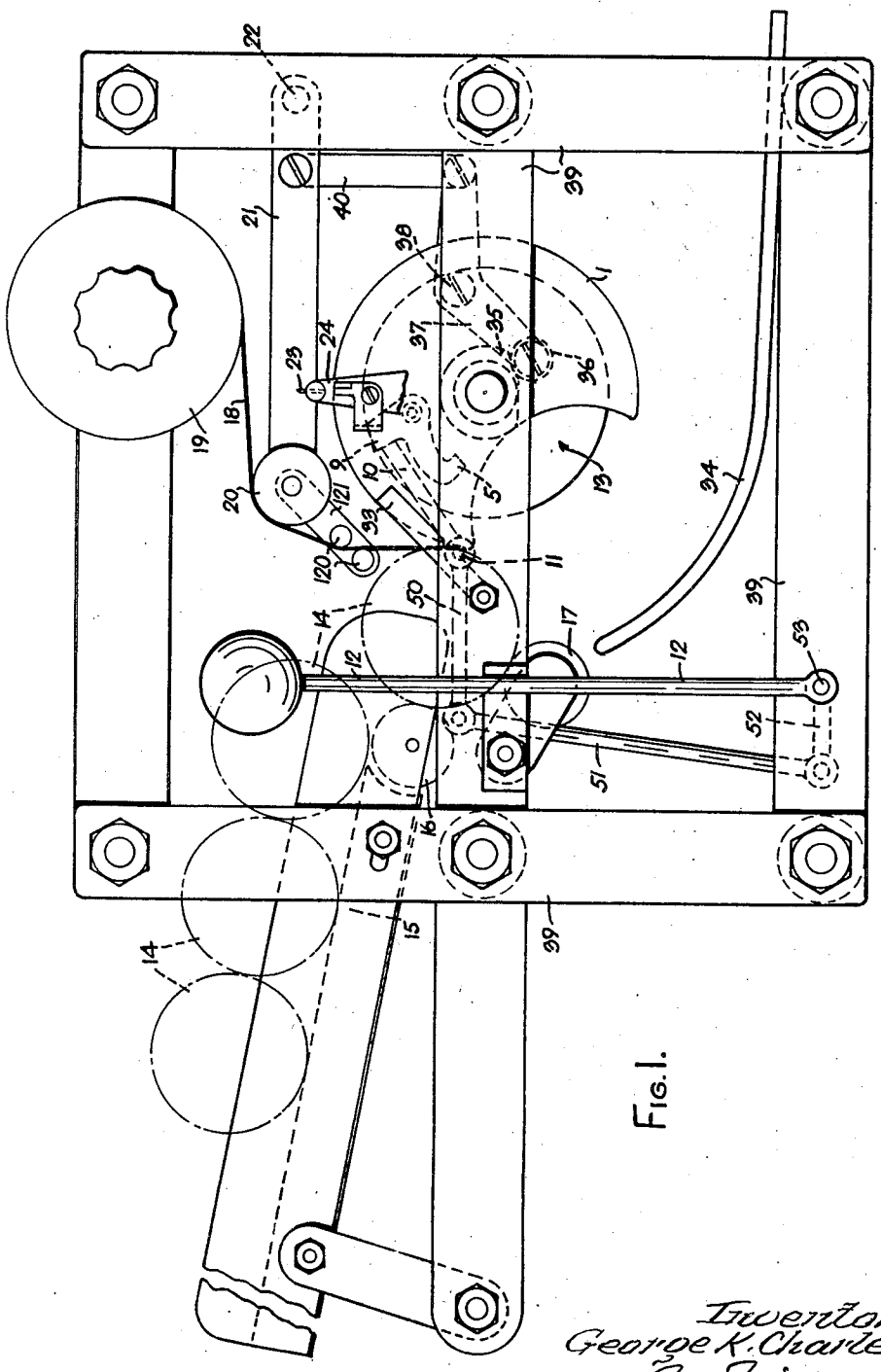


FIG. 1.

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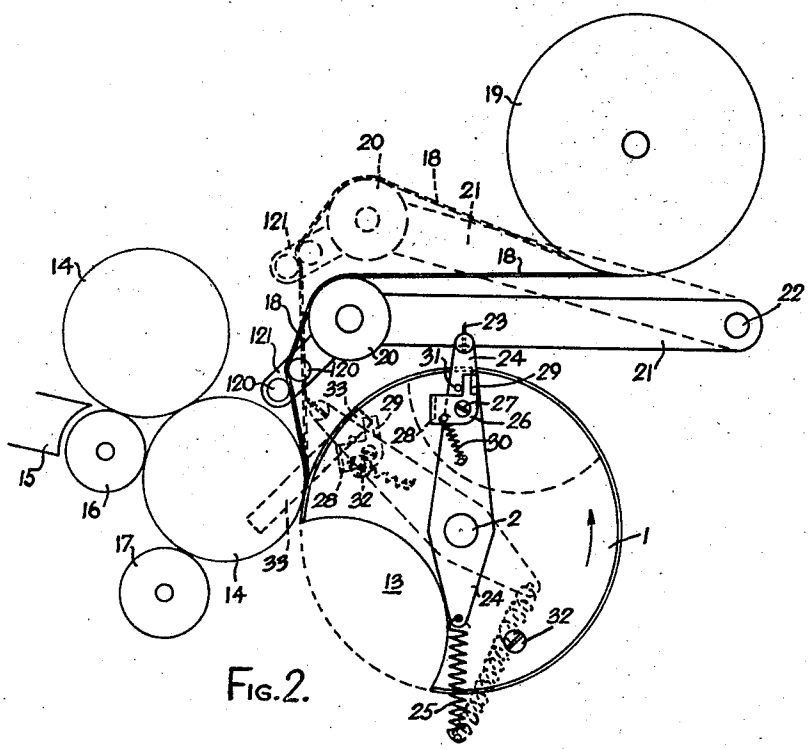


FIG. 2.

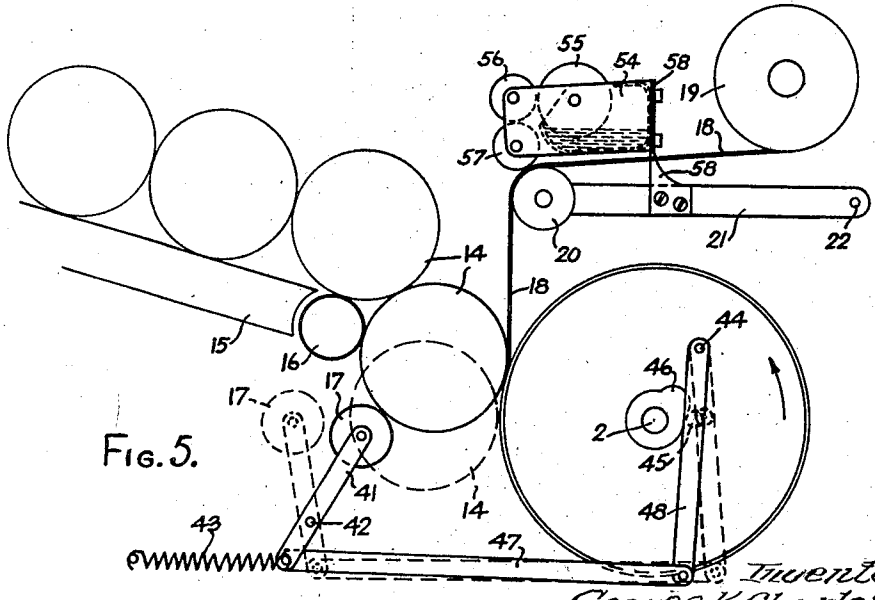


FIG. 5.

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APPARATUS FOR APPLYING ADHESIVE STRIP TO CYLINDRICAL CANS OR OTHER CONTAINERS

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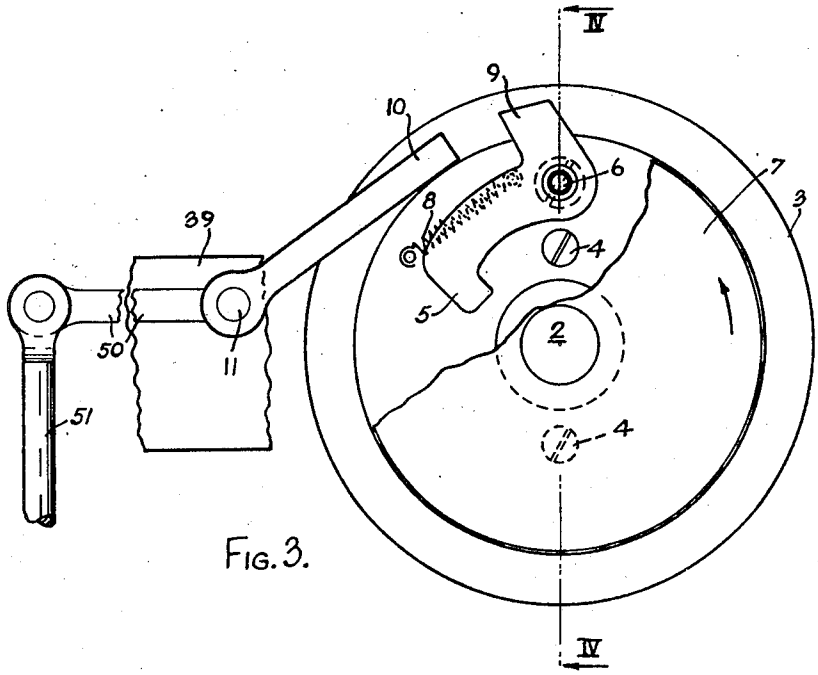


FIG. 3.

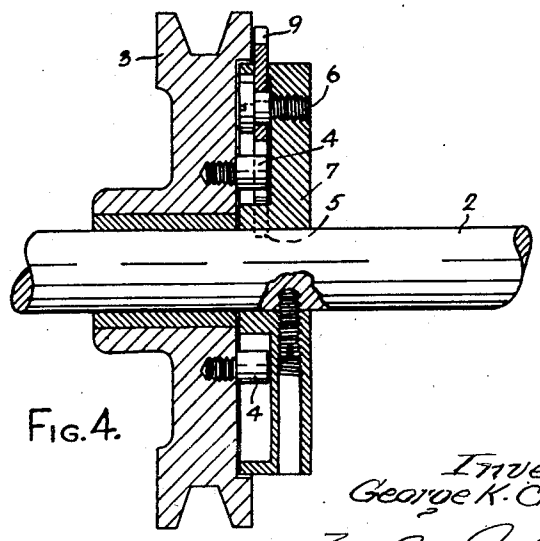


FIG. 4.

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UNITED STATES PATENT OFFICE

2,503,470

APPARATUS FOR APPLYING ADHESIVE STRIP TO CYLINDRICAL CANS OR OTHER CONTAINERS

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Application November 25, 1947, Serial No. 788,064
In Great Britain November 28, 1946

3 Claims. (Cl. 216—29)

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The invention concerns an improved apparatus for applying strip to cylindrical cans or other containers.

The strip may be in the form of adhesive tape, so called pressure sensitive strip, that is a strip which when pressed onto a surface will adhere to it without requiring moisture, or gummed strip, or non-adhesive strip, such as a label strip, that is, a strip of printed labels. When a gummed strip or a non-adhesive strip is used it is necessary to provide means for applying moisture or adhesive, such as gum solution, to the strip. In the following description and claims the term strip is to be considered as covering all these forms.

The apparatus according to the invention is provided with a rotary pressure drum, means for rotating the drum as required, means for supporting a cylindrical container opposite to the drum so that the container can rotate, means for suspending strip between the container support and the drum so that the strip can be trapped between the container and the drum in order that when the drum is rotated, it rotates the can and winds the strip and presses it around and firmly on the container, means being provided to sever the strip after the can has been encircled with strip, and means also being provided to release the can after the severed portion of strip has been completely pressed onto the can.

The release of the container may be effected by the provision of a gap or recess in the periphery of the pressure drum so that when a container is to be released the gap is brought opposite to the container which then rolls into it and is free to roll away.

Alternatively the drum need not be provided with a recess but means may be provided to effect a relative displacement of the support for the container and the drum to provide the necessary gap for the release of the container.

Means are provided to ensure that while the strip is being wound on a container and strip is being drawn from a spool a determined length of strip shall be ready for the next container.

The severance of the strip is effected by a knife, such as a serrated blade or by an electrically heated element as known in connection with older forms of apparatus for applying adhesive strip to cans or other cylindrical container.

In the apparatus according to the invention the knife or electric element is preferably carried by a lever freely fulcrumed on the axis of the pressure drum and normally held away from the strip by a spring, the drum having a device for engaging with the lever and moving it over to the strip to effect the severance of the strip a short time before the adherence of the strip is completed, the device allowing the lever to return to its normal position after severance has been effected.

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In the drawings—

Figure 1 is a side view of one form of apparatus according to the invention.

Figure 2 is a side view on a larger scale illustrating the severing device.

Figures 3 and 4 are, respectively, a side view and a front sectional view of a clutch the section being taken on IV—IV, Figure 3.

Figure 5 is a somewhat diagrammatic side view illustrating an alternative means for releasing cans and also means for moistening or gumming a non-adhesive strip.

In the example illustrated by Figures 1 to 4 a pressure drum 1, provided on its periphery with a rubber or other frictional surface, is fixed on a shaft 2 which is rotated as required by an electric motor or other source of power through the medium of a clutch for instance of the form shown in Figures 3 and 4. This comprises a pulley 3 which is driven by a driving belt from the motor, not shown, and is freely mounted on the shaft 2. The pulley 3 has driving pins 4, 4 for driving engagement with a pawl 5 which is pivoted at 6 on a disc 7 which is fixed to the shaft 2. The pawl 5 has a spring 8 which tends to hold the pawl in the path of the pins 4, 4. The pawl 5 has a lug 9 for engagement with a movable stop 10 which is fixed on a fulcrum pin 11 mounted to rotate on the frame 39 of the apparatus.

The pin 11 is provided with a crank 50 connected by a connecting-rod 51 to a crank 52 fixed on the fulcrum shaft 53 of an operator's handle 12, the shaft 53 being mounted on the frame 39.

Movement of the operator's handle 12 to the left, Figure 1, removes the stop 10 from the path of the lug 9 on the pawl 5 so that the pawl is in the path of the driving pins 4 and on engagement with one of them the disc 7 and consequently the shaft 2 are rotated.

When the handle 12 is moved to the right, Figure 1, against a fixed stop 49, the stop 10 is moved into the path of lug 9 on the pawl 5. On engagement of the lug 9 with the stop 10 the pawl 5 is moved about its pivot pin 6 and out of the path of the driving pins 4, 4, so that the disc 7 and therefore the shaft 2 are arrested in a definite position, namely, with the drum 1 in the position indicated in Figure 1 ready to engage with a can 14.

The pressure drum 1, Figures 1 and 2, has a gap 13 in its periphery and in the position of arrest this gap is below the position of contact of the can or other cylindrical container 14 which is in engagement with the drum and is to be wound with strip.

The cans 14 are fed down a chute 15 onto two freely rotatable rollers 16 and 17 arranged opposite to the drum 1.

These rollers may be adjustably mounted so that their positions relatively to the drum can be varied to suit the size of can to which a strip is to be applied.

Strip 18 from a spool 19 is led over a roller 20 carried by a lever 21 pivoted at 22 on the frame 39. The strip may be of any desired type, for instance adhesive tape, so called pressure sensitive strip or labels in strip form. It passes over the roller 20 and between two guide rollers 120 on an arm 121 carried by the lever 21. The strip 18 depends in front of the drum 1 so that when a can 14 is fed onto the roller 17 the depending strip is trapped between the can and the drum 1. Consequently, when the can is rotated by the drum 1 the strip 18 is wound round and pressed firmly on the can so that it adheres to it.

When sufficient strip has been so wound as to leave an overlap it is severed by a serrated blade 23. The blade 23 is carried on a lever 24 pivoted on the shaft 2 and normally held upright by a spring 25 as shown in full lines in Figure 2. A pawl 26 is pivoted at 27 on the lever 24. It has two flanges, a laterally directed concentric flange 28 and a radial 29. It is normally held by a spring 30 with the flange 29 in contact with a pin 31 on the lever 24 in the position shown in full lines in Figure 2, in which position the flange 28 is in the path of a driving pin 32 situated on the drum 1 just ahead of the gap 13.

On the rotation of the drum 1 the pin 32 engages with the flange 28 and the lever 24 is moved to bring the knife 23 against the strip 18 and cut it as indicated in dotted lines in Figure 2. When the strip has been cut, the flange 29 strikes a fixed stop 33 so that the pawl 26 is rocked on its pivot 27 against the action of the spring 30 and the flange 28 is withdrawn from the path of the pin 32. The lever 24 is then returned to its normal position by the spring 25, the pawl 26 also being returned by its spring 30 to its normal position.

The continued rotation of the drum 1 continues the rotation of the can in front of it until the severed portion of strip has been wound on the can including the cut off end or overlapping portion. The gap 13 then arrives opposite to the roller 17 so as to release the can onto a chute 34.

In order that a fresh depending portion of strip 18 of appropriate length shall be brought into position the lever 21 is raised during the winding of the strip on a can, and lowered immediately the strip has been severed by the knife 23. During the raising of the lever 21 the roller recedes along the tensioned strip into the position indicated by dotted lines in Figure 2.

The required motion of the lever 21 is imparted by a cam 35 which is fixed on the shaft 2 and engages with a roller 36 carried by a bell-crank lever 37 which is pivoted at 38 on the frame 39 and is connected by a link 40 to the lever 21.

An alternative means for releasing the wound cans is illustrated by Figure 5. The drum 1 in this example is not provided with a gap in its periphery. The roller 17 is carried by a lever 41 pivoted at 42 and held in its normal position by a spring 43. The lever 41 is connected by a rod 47 to a lever 48 which is pivoted at 44 and carries a roller 45 in engagement with a cam 46 on the shaft 2. The cam 46 is of such shape and so set on the shaft 2 that when a can has been completely wound the lever 41 is rocked to carry the roller 17 away sufficiently to leave a gap between it and the drum 1 to release the can, after which the spring 43 returns the lever 41 and the roller 17 to their normal position.

It will be understood that a similar severing device to that described with reference to Figure 2 is provided.

In some cases it is desirable to use an electrically heated wire element instead of a knife to sever the strip, similar to that described in Patent No. 2,471,310.

In Figure 5 means are illustrated for applying moisture or adhesive to the strip 18. For example the strip 18 may be a printed label strip. It may be a gummed strip requiring moisture or one requiring gum or other adhesive. These means comprise a trough 54, containing water or gum solution accordingly as the strip 18 is a pregummed strip or not, and rollers 55 and 56 feeding a roller 57 which applies the moisture or adhesive to the strip 18. The trough 54 is supported by a bracket 58 on the lever 21. The moistening or gumming means are merely described and illustrated by way of example as moistening or gumming devices are well known in connection with labelling machines. Such means may be applied to the form of machine shown in Figures 1 and 2.

I claim:

1. An apparatus for applying an adhesive strip to cylindrical containers, comprising a pressure drum, a spool for supplying the adhesive strip, means for suspending the end of said strip in front of the pressure drum and including a suspension lever carrying a suspension roller over which the strip is led from said spool, means for rotatively supporting a cylindrical container against said drum with said strip end nipped between the container and the drum so that the strip is wrapped around and pressed on the container as it is rotated on said supporting member, and means for rotating the pressure drum and simultaneously raising said suspension lever when the end of the strip has been nipped to tension the strip and also draw off a selected length from the spool.

2. An apparatus for applying an adhesive strip to cylindrical containers, comprising a pressure drum, a spool for supplying the adhesive strip, means for suspending the end of said strip in front of the pressure drum and including a suspension lever carrying a suspension roller over which the strip is led from said spool, means for rotatively supporting a cylindrical container against said drum with said strip end nipped between the container and the drum so that the strip is wrapped around and pressed on the container as it is rotated on said supporting means, means for rotating the pressure drum and simultaneously raising said suspension lever when the end of the strip has been nipped to tension the strip and also draw off a selected length from the spool, a lever pivoted on the axis of the pressure drum and supporting a cutter, a spring biasing said lever to inoperative position, a pawl pivoted on said lever, a spring biasing said pawl to operative position, a driving pin on the pressure drum for engaging with said pawl to swing said lever over and operate said cutter to sever

the strip when the container has been wrapped, and means for pivoting said pawl to release said driving pin when said strip is severed.

3. An apparatus for applying an adhesive strip to cylindrical containers, comprising a pressure drum, a spool for supplying the adhesive strip, means for suspending the end of said strip in front of the pressure drum and including a suspension lever carrying a suspension roller over which the strip is led from said spool, means for rotatively supporting a cylindrical container against said drum with said strip end nipped between the container and the drum so that the strip is wrapped around and pressed on the container as it is rotated on said supporting means, means for rotating the pressure drum and simultaneously raising said suspension lever when the end of the strip has been nipped to tension the strip and also draw off a selected length from the spool, means for arresting the pressure drum after each rotation and including a freely mounted driving clutch member and a driven

clutch member fixedly mounted in relation to the pressure drum, a pin on said driving member, a dog pivoted on the driven member, a spring on the driven member for holding said dog in operative position, a stop for disengaging said dog and pin at the end of a revolution of the pressure drum, and means for moving said stop out of and into operative position relatively to the path of revolution of said dog for starting and stopping the rotation of the pressure drum.

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