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W. BINDSZUS

2,276,282

RAZOR BLADE WRAPPING MACHINE

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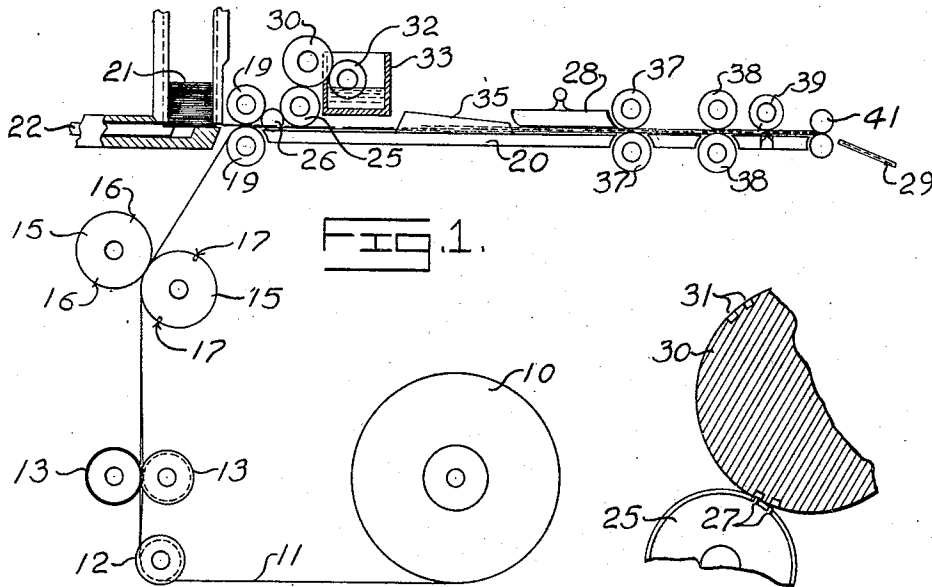


FIG. 1.

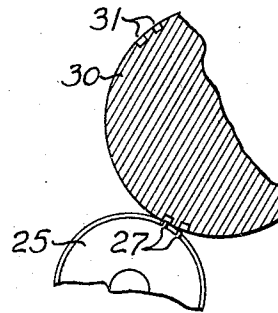


FIG. 2.

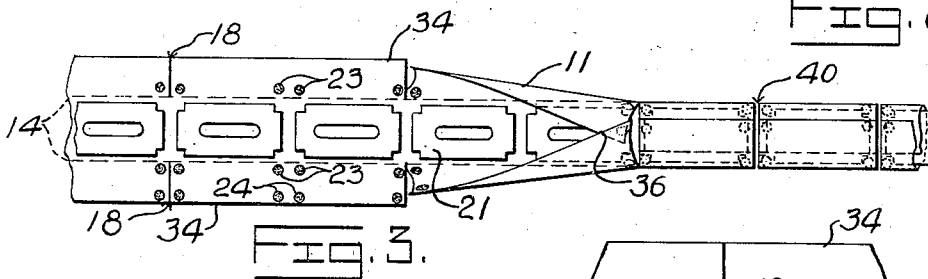


FIG. 3.

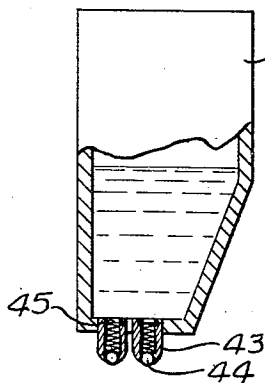


FIG. 4.

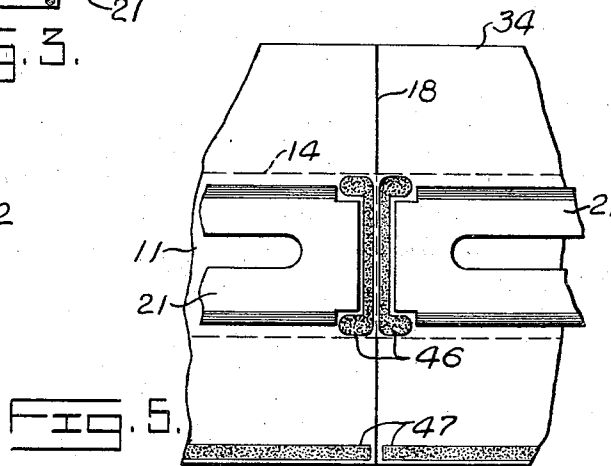


FIG. 5.

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UNITED STATES PATENT OFFICE

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RAZOR BLADE WRAPPING MACHINE

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7 Claims. (Cl. 93—3)

My invention relates to improvements in razor blade wrapping machines and has for its object to protect the blade, both during the wrapping operation and afterwards, against movement within its wrapper to avoid dulling its cutting edge or edges by contact with the folds thereof.

Another object of my invention is to so simplify the method of wrapping and the motions of the machine as to attain a high wrapping speed, say 300 blades per minute, thus effecting an economy in labor, and reducing the cost of the wrapping operation and consequently the price of the blades.

While it is still customary to wrap thin double-edged steel blades in moisture-repellent complete lining envelopes (having top, bottom, and side flaps), these in turn being enclosed in paper envelopes bearing printed matter, a plurality of blades so wrapped being then inserted in the usual cardboard box or "tuck," and the latter, finally, wrapped in tissue or Cellophane—the use of Cellophane for the outermost wrap has so greatly increased efficiency in sealing the package of blades, as against rusting by atmospheric moisture, that the described plurality of wrappings originally adopted to protect blades is no longer necessary for that purpose. Such multiple wrappings, moreover, leave the blades free to shift about therein during the wrapping operation and later, during shipment and before sale, with consequent damage to their cutting edges; in fact, the complexity of motions performed by the present machines and the very pains taken to provide multiple protective wrappings thus defeat their intended purpose.

I have found it practicable to dispense, first, with the printed outer paper envelope in its entirety, and, second, with the side flaps of the usual waxed-paper lining envelope, and to wrap blades simply and efficiently by disposing them in spaced relation upon a continuous moving paper strip which is then continuously formed into a flat paper tube, to then fix the blades therein spaced from the folds of the wrap, and thereafter to sever the individual wrapped blades.

With the foregoing and other objects in view, my invention consists of the novel combination and arrangement of parts hereinafter described in their preferred embodiment, particularly pointed out in the appended claims, and illustrated in the accompanying drawing, wherein like parts are designated by the same reference characters throughout the several views.

In the drawing:

Figure 1 is a diagrammatic side view of my improved razor-blade wrapping machine;

Fig. 2 is an enlarged fragmentary view of two rolls in the train for applying adhesive to the wrapping strip;

Fig. 3 is a plan view, showing the blades disposed upon the wrapping strip, the pattern in which adhesive may be applied to the latter, and the method of forming and folding the flaps, as well as of severing the individual blades;

Fig. 4 is an end view partly broken away of a modified form of glue-box; and,

Fig. 5 is an enlarged fragmentary view of two blades disposed upon the wrapping strip and showing a modified pattern of adhesive applied thereto.

Referring to Figs. 1 to 3, on a reel 10 is wound a ribbon or strip of wrapping material 11, which may be the usual waxed or paraffin-coated paper, coated either on both sides or upon the outside only (I have found that uncoated paper next the blades absorbs and retains the protective oil in which the blades are bathed prior to wrapping and thus retards evaporation of the oil). The strip 11 proceeds in a horizontal plane, under a guide roll 12, and then upward between a pair of scoring rolls 13, one of which has two annular ridges and the other corresponding annular grooves so disposed as to divide the strip lengthwise approximately into thirds with two continuous parallel scores, as at 14 (Fig. 3). The strip 11 then passes between a pair of rolls 15, one of which is equipped with two pairs of transverse knives 16 and the other having formed therein corresponding grooves 17 to receive the knives which cut two transverse opposite notches in the strip extending from its edges inward to the score lines 14, but leaving its central portion intact as shown at 18 (Fig. 3). One pair of knives 16 is set opposite the other pair in the periphery of roll 15 carrying the knives, and the diameter of the pair 15 is calculated to notch the strip 11 as described regularly at points corresponding to the length of two wrapped blades placed end to end, as will hereinafter be more fully explained.

The strip 11 next passes between a pair of rolls 19 and proceeds in a horizontal plane over a runway 20. The lowermost blade 21 in a stack is positively advanced in timed and spaced relation by a slidable reciprocating pusher 22 to the feeder rolls 19 and upon the upper surface of the strip 11, on which upper surface at each space left between blades a predetermined six-spot

pattern of adhesives 23, 24 (Fig. 3) is im-
pressed or printed. The adhesive used may con-
tain wax, or glue, or other known material may
be used. To effect this printing of adhesive I
provide a roll 25 driven through a gear wheel 26
by a gear (not shown) on the uppermost feed
roll of the pair 19. On its periphery, in prop-
erly spaced relation roll 25 has raised portions
27 corresponding to said six-spot pattern of ad-
hesive 23, 24, and a roll 30 having indentations
31 corresponding in disposition to said raised
portions 27, is held in spring-pressed contact
with a roll 32 mounted within the glue box 33
and, due to the pressure maintained between
these rolls, adhesive picked up by the roll 32
is continually squeezed back while the indenta-
tions 31 alone are filled with adhesive from
whence, upon rotation of the rolls, it is picked
up by raised portions 27 and printed in timed
relation upon the flaps 34 (Fig. 3) of the moving
strip 11, as explained, in each space left between
successive blades.

The strip 11 bearing the blades 21 now passes
through a stationary spiral folding cam 35 which
folds the flaps 34 one over the other, as shown
at 36 (Fig. 3, thus bringing the four spots 23
of adhesive adjacent the score lines into contact
with the central continuous portion of the strip
11 so as to coincide with the four recessed cor-
ners of each succeeding pair of adjoining blades,
while the two adhesive spots 24 seal the flaps 34.
The strip now passes beneath a weighted plate
28, which may be heated, and which presses the
scored folds of flaps 34 and insures sticking of
the adhesive. The strip next passes between two
successive pairs of pulling rolls 37, 38. Between
feed rolls 19 and pulling rolls 37 the strip 11
is maintained steady under fixed even tension
to prevent displacement of the blades while they
lie free thereon and before they are fixed as by
the adhesive. It will be understood that, due to
the accuracy of the rotary motions used in my
improved machine, the blades are held by ad-
hesive at their four recessed corners without any
adhesive getting upon the blades. A transverse
knife 39 then severs the individual wrapped
blades, as shown at 40 Fig. 3, and just as each
wrapped blade 29 is severed it is seized by a
pair of rolls 41 driven at slightly increased speed
and which therefore tend to tear the severed
wrapped blade from the succeeding blade, in-
suring a positive severance, and deliver it to a
stack; or the wrapped blades may be fed directly
to a "tucking" machine for insertion in lots in
the usual cardboard box or "tuck," and thence
for the final wrap, as in Cellophane.

It will be understood that the individual mo-
tions of my razor blade wrapping machine are
geared together and all operations are synchro-
nized by a chain and sprocket drive.

Referring to Fig. 4, the modified glue box 42
there shown is provided with nipples 43 having
ball stoppers 44 held closed by springs 45. In
practice, the box 42 may be mounted for rotary
motion and synchronized so that in its lower-
most position the stoppers 44 striking the strip
11 supported upon the runway 20 are forced from
their seats and, due to inertia, the desired amount
of adhesive is thrown from the nipples 43 upon
the strip. Upon withdrawal of the box 42 from
the strip the stoppers 44 close under action of
their springs 45. It will be understood that
six nipples 43 are provided disposed in the bot-
tom of the box 42 so as to conform to the pat-
tern of adhesive spots shown at 23, 24, Fig. 3.

Referring to Fig. 5, strip 11 is here shown
printed with a modified pattern of adhesive 46,
47 adapted to seal both the open ends and the
flaps of the individual blade wrappers. The
particular design of the adhesive pattern 46 for
sealing the ends of the individual wrappers is
also adapted to effectively hold the blade there-
in against movement in any direction, as will
be clear from the figure. To apply adhesive in
the pattern shown it is necessary merely to
modify the design of raised portions 27 and of
corresponding indentations 31 of the rolls 25, 30
respectively, to conform them to the design
shown at 46, 47.

Briefly stated, the operation of the machine
is as follows: A paper strip is fed first to scoring
rolls which divide it approximately into thirds
with two continuous parallel scores; the strip is
next notched laterally from its opposite side
edges inward as far as the score lines, leaving
the central third of the strip intact, these notches
being made regularly at a point which will cor-
respond to the space to be left between every
other blade. The blades are fed by a pusher to
feeder rolls, together with the strip, disposed
centrally thereof with their cutting edges par-
allel with but spaced from the scores, and ad-
hesive is applied to the two outer thirds of the
strip in a predetermined pattern adjacent the
spaces left between the blades. The flaps formed
by notching of the outer thirds of the strip are
then folded by a stationary spiral folding cam,
one over the other, so that the adhesive contacts
with the central part of the strip, coinciding
with the four recessed or cut-away corners of
each two adjoining blades, and thus fixes the
blades within the flat tubes thus formed as well
as seals the flaps. The wrapped blades are then
weight-pressed and passed by pulling rolls for
severance, one at a time, by a rotary transverse
knife.

Although the drawing and the above specifica-
tion disclose the best mode in which I have con-
templated embodying my invention, I desire to
be in no way limited to the details of such dis-
closure for, in the further practical application
of my invention, changes in the constructional
details of the machine may be made as circum-
stances require or experience suggests, without
departing from the spirit of the invention within
the scope of the appended claims.

What I claim is:

1. A razor blade wrapping machine of the
character described and wherein the strip of
wrapping material serves as a conveyor for the
blades, comprising, in combination, means for
scoring the strip lengthwisely, means for notch-
ing the opposite edges of the strip transversely
at regular intervals to form flaps foldable along
the scores, means for successively feeding blades
together with the strip, means for gumming the
flaps, means for folding the flaps one upon the
other to envelop the blades, driving rolls coact-
ing with said feeding means to maintain the strip
steady under a fixed tension, and means for sev-
ering the individual wrapped blades.

2. A razor blade wrapping machine of the
character described comprising, in combination,
means for continuously scoring the wrapping
strip lengthwisely with two scores, means for
notching the opposite edges of the strip trans-
versely at regular intervals to form opposite flaps
foldable along said scores, means for successively
feeding blades together with and upon the upper
surface of the strip, means for gumming said

flaps, means for folding said flaps one upon the other to envelop the blades, driving rolls coacting with said feeding means to maintain the strip taut and free from vibration, means for severing the individual wrapped blades, and a pair of rolls having a surface speed slightly higher than the speed of said driving rolls for ensuring such severance.

3. A razor blade wrapping machine of the character described comprising, in combination, a pair of rolls for scoring the wrapping strip with two spaced parallel scores, a pair of rolls having transverse knives for notching the opposite edges of the strip to form flaps, a pusher for successively advancing the blades, a pair of rolls for feeding the blades and strip, means for gumming the flaps with an adhesive in a pattern calculated to fix the blades against movement within their envelopes when the flaps are sealed, means for folding the flaps along said scores to envelop the blades, means for ensuring adhesion of said flaps, a pair of driving rolls coacting with said feeding rolls to keep the strip taut, and means for severing the individual wrapped blades.

4. A machine of the character described for wrapping flat articles comprising, in combination, a pair of rolls for scoring the wrapping strip, a pair of rolls for notching the opposite edges of said strip transversely to form flaps, means for successively advancing the articles, a pair of rolls for feeding the articles together with the strip, a runway to support the strip with the articles thereon, a glue box mounted for rotary motion, means on said box for gumming said flaps in a pattern calculated to retain the articles within their wrappers, a stationary spiral folding cam for folding said flaps upward and inward along said scores one upon the other to envelop the articles, pressing and heating means to ensure adhesion of said flaps, pairs of driving rolls coacting with said feeding rolls to keep the strip taut and steady, and a transverse rotary knife to sever the individual wrapped articles.

5. The method of wrapping razor blades in a continuous moving paper strip which consists in scoring the strip lengthwisely with two parallel scores located centrally thereof and spaced apart a distance greater than the width of a blade, notching the strip transversely to form opposite

flaps, successively feeding blades in spaced relation with their cutting edges parallel to said scores, together with, and centrally of the strip, gumming both flaps adjacent the spaces between blades and adjacent the edge of one flap in a pattern adapted to fix the blades against movement within their wrappers, folding the flaps one over the other, pressing the tubes thus formed, and severing the individual wrapped blades.

6. The method of wrapping razor blades in a continuous moving paper strip which consists in scoring the strip with two continuous parallel scores spaced to divide the strip approximately into thirds, notching the outer thirds of the strip transversely at regular intervals to form opposite flaps having a length equal to at least two of the completed wrapped blades placed end to end, successively feeding blades in spaced relation with their cutting edges parallel to but spaced from said scores, together with, and centrally of the strip, gumming both flaps adjacent the spaces between blades and adjacent the edge of one flap with a predetermined pattern of adhesive adapted to fix the blades against movement within their wrappers, successively folding the flaps one over the other, subjecting the continuous envelope thus formed to pressure and to heat, and severing the individual wrapped blades.

7. The method of wrapping razor blades having recessed corners in a continuous moving strip which consists in scoring the strip with parallel continuous scores spaced to divide the same approximately into thirds, notching the outer thirds of the strip transversely at regular intervals to form opposite flaps, successively feeding blades in spaced relation with their cutting edges parallel to but spaced from said scores, together with and disposed centrally upon the strip, maintaining the strip steady under tension as long as the blades lie free thereon, gumming both flaps adjacent the spaces between blades and adjacent the edge of one flap with an adhesive in a predetermined pattern adapted to coincide with the recessed corners of the blades thereby to fix the latter against movement within their wrappers, folding the flaps one over the other, pressing the tubes thus formed, and severing the individual wrapped blades.

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