Feb. 14, 1967 D. B. HALSTEAD 3,303,632

NAIL PACKAGING DEVICE

Filed Aug. 3, 1964 3 Sheets-Sheet 1

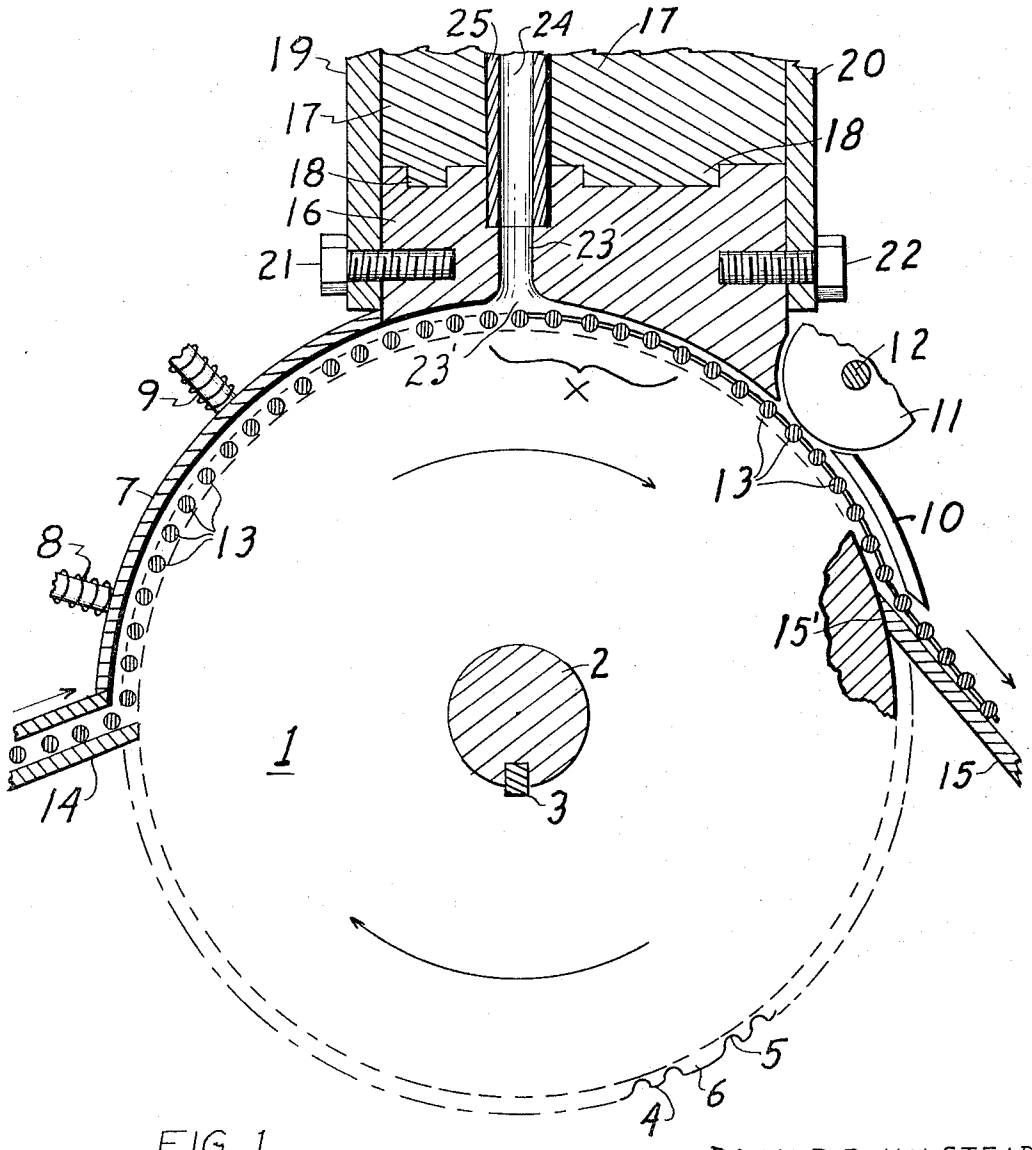

FIG. 1

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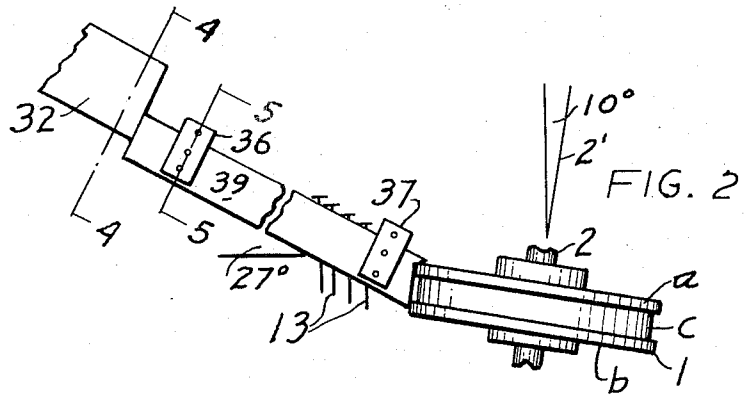

FIG. 2

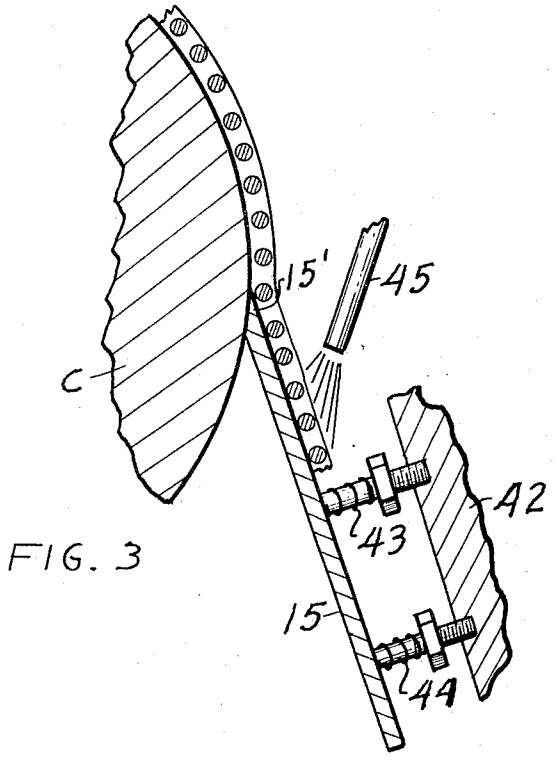

FIG. 3

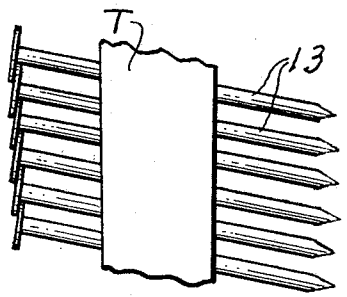

FIG. 10

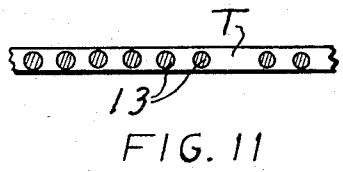

FIG. 11

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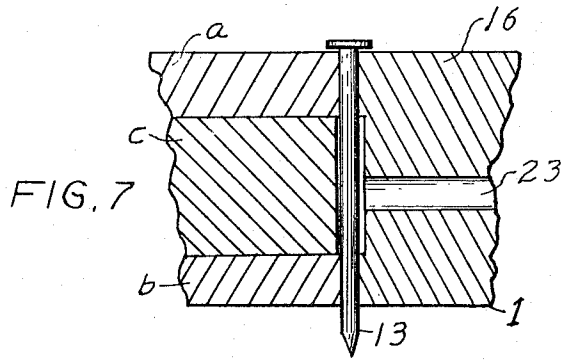
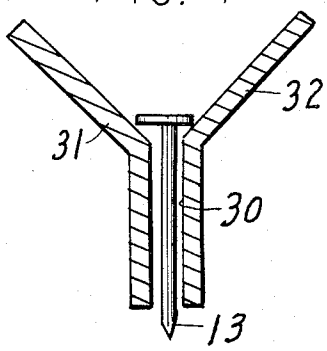


FIG. 7

FIG. 4



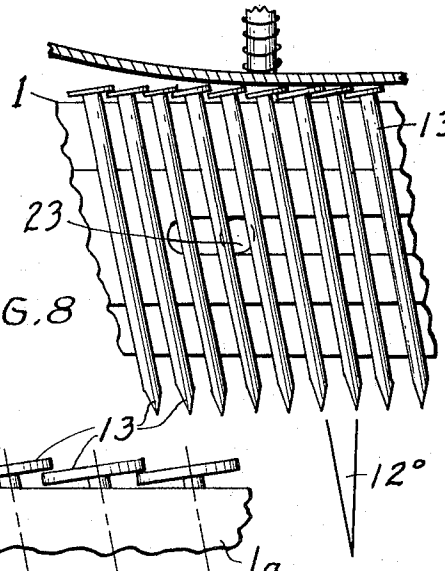


FIG. 8

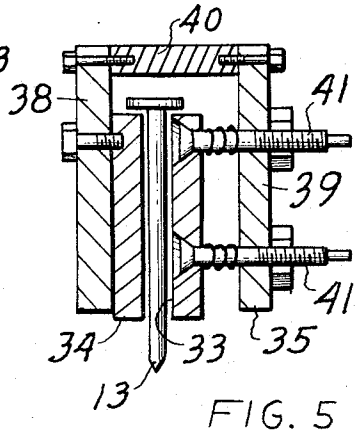


FIG. 5

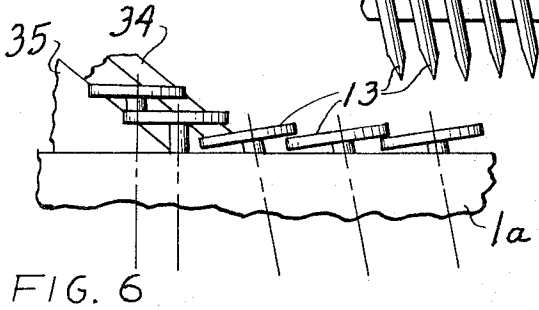


FIG. 6

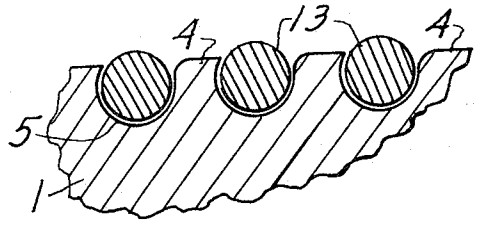


FIG. 9

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3,303,632

NAIL PACKAGING DEVICE

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Filed Aug. 3, 1964, Ser. No. 387,006
6 Claims. (Cl. 53—140)

This invention relates to means, methods and ways of forming and packaging nails and the like into strip and/or tape form which are adapted to be fed into mechanism for use such as a nailing machine and the like. Nailing machines are now common in the building and fabricating trades.

In this invention, the nails are packaged in spaced groups which contain a predetermined number of nails per group, unit or section along a strip in tape form. In such a form, the nails can be easily fed to nailing machines.

The strips or tapes are arranged to accommodate so many nails and wherein the strips or tapes are produced as a continuous string by the continuous operation of a plastic extruding device and which plastic binds together so many nails in group arrangement in sizes required by nailing machines.

Any type or kind of plastic material may be employed as the binder, providing it is of the type that can be easily severed when and where desired, and providing the plastic is of that nature that the nails can be easily freed therefrom without danger of residue remaining thereon which might foul the operation of a nailing machine.

One of the principal objects of this invention is to present a new and novel manner of packaging nails and the like to be used in a projector type of machine and in which means are provided to force the nails into various materials for securing them together or to something else.

Another object is to provide means and methods of producing strips or tapes of nails and the like in an orderly fashion which are in perfect formation for efficient use in a nailing machine and the like.

Still another object is to produce strips of nail groups containing predetermined numbers of nails and the like and wherein the groups are spaced apart for easy severance to accommodate specific types of machines.

Other objects and forms of this invention will become apparent upon careful reading of the specification and claims.

In the drawings:

FIG. 1 is a vertical sectional view of a nail packaging machine embodying principal features of the invention;

FIG. 2 is a plan view showing how the nails are fed to a packaging wheel means;

FIG. 3 is a vertical view of a portion of the device showing how the packaged nails are removed from the packaging wheel means;

FIG. 4 is an enlarged detail of a part of the machine taken on the line 4—4 of FIG. 2;

FIG. 5 is an enlarged detail of a part of the machine taken on the line 5—5 of FIG. 2;

FIG. 6 is also an enlarged detail of a portion of the packaging machine which is shown in elevational view;

FIG. 7 is another enlarged detailed portion of the machine taken at right angles to that shown in FIG. 8 and with parts in section;

FIG. 8 is another enlarged detailed portion with parts in section, this view is taken along the wheel 1 at its perimeter;

FIG. 9 is still another enlarged detailed portion in sectional view;

FIG. 10 is an enlarged elevational view of a portion of the packaged nails;

FIG. 11 is an edge view of an enlarged strip of packaged nails showing spaces between the groups or units thereof.

As shown in the drawings, particularly FIG. 1, for the present, there is illustrated a wheel means or guide wheel means indicated in general by the reference character 1 and this wheel means is shown as mounted upon an axle-shaft or bearing shaft 2 and fixed thereto by the key 3. The axle-shaft is rotated by any suitable means, not shown, but which means may be a variable speed electric motor. The wheel means will be more fully explained later, but for the present, it should be sufficient to say that this wheel means 1 is provided with a plurality of teeth 4 and which teeth provide the plurality of nail holding pockets or recesses 5. Here and there along the periphery of the wheel means 1 a pocket is omitted and a blank space provided as indicated at 6 so that the units or groups of packaged nails are separated to provide stacks of proper size in accordance to the requirements of the trade.

Spaced from a portion of the wheel means, there is a shield or wall 7 which is held snug to the wheel's periphery by the two spring devices 8 and 9, as indicated. Another portion of the wheel's periphery is shielded by a wall 10 and which wall may also be held snug to the wheel's periphery by suitable spring means such as shown at 8 and 9. A pressure wheel 11 is shown mounted upon an axle means 12 and this wheel is employed to firm the plastic material to the nails which are indicated in general by the numeral 13.

The nails to be packaged are fed to the pockets of the packaging wheel means 1 by means of a trough indicated in general by the numeral 14; and the nails are removed from the wheel's periphery by the means indicated in general by the numeral 15.

The plastic extruder has the nozzle head portion 16 attached to the adapter means 17 and held in exact position by the offset portions along the line 18. Locking plates 19 and 20 hold the organization together by means of cap screws of the type shown in the drawings at 21 and 22. The nozzle head portion 16 has the flow channel or passage 23 which is in registration with a similar flow channel or passage 24 of the adapter means 17. The flow liners 25 and 26 are formed in their respective blocks 16 and 17.

FIGS. 2, 4, 5 and 6 show some details of the nail handling means for feeding nails to the pockets in the packaging wheel. The nails are fed from a conveyor or hopper means, not shown, into a channel means 30 formed by the flared walls 31 and 32 and then into the channel 33 formed by the walls 34 and 35, as shown. The walls 34 and 35 are adjusted to form a predetermined size of channel 33 through the adjustment operation of a clamping means indicated at 36 and 37. Each one of these clamps comprises opposite plates 38 and 39 spaced by plate 40 and the channel strips are adjusted to provide a proper size channel by shifting the bolts 41 as desired.

The packaging wheel means 1 consists of a pair of spaced apart sprocket-like discs or round plates *a* and *b* spaced by a short cylindrical means or portion *c* which may be termed simply a wheel spacer. This wheel spacer has a smooth perimetrical surface upon which rides the bevelled end 15' of the unloader strip or plate 15. Obviously, the two round discs have the mentioned teeth 4 and the pockets 5 along their circumference. Note, that the axis line 2' is about ten degrees askew so as to better accommodate the nails from the feeder channel 33 to the pockets. Note FIG. 3 wherein a wall member 42 supports the adjustors 43 and 44 so as to provide a perfect alinement of the scraper element 15' with respect to the smooth spacer cylinder *c*.

As the packaging wheel means **1** turns about its center at a predetermined speed, nails are fed into the various pockets **5** of the pair of spaced apart sprocket-like discs *a* and *b* and when the nails reach the area beneath the extruder mouth or nozzle **23'**, the plastic, under pressure, and in a molden stage, surrounds the nail or nails therebeneath or/and beside the annular channel formed by the sprocket-like discs *a* and *b*. The area indicated at *x* along the cylinder *c* is termed the area of strip or tape formation,, that is, at the mouth of nozzle **23'** the plastic enters the space or channel on cylinder *c* and when the wheel means **1** reaches the line to the right of the area (FIG. 1) the plastic is near the set or harden state and holds the nails together in prearranged groups. As the wheel means **1** turns, the loaded strip or tape is discharged at **15'**. Lengths of the strip or tape may be broken away as desired in accordance to the sizes required.

The wheel means **11** presses the plastic into firm position within the annular channel as it is rotated. FIGS. 10 and 11 show how the tape appears when it has been formed at the discharge end of the process. The plastic tape is indicated by the letter T. The sprocket-like discs *a* and *b* each may have sixty-two teeth with two blanks so as to provide two strips or tapes of nails holding about thirty nails each. Any size of nails may be taped or packaged in the machine.

Any suitable means may be employed for cooling the wheel means **1** so that the plastic material is near set or semi-hardened before reaching the scaper means **15**. Just cold water or other cooling fluid may be employed and made to run over a portion of the wheel means **1** as indicated at **45**. This would normaly be sufficient for cooling purposes. Later-on, cooler or colder fluid may be employed to harden the plastic material.

Certain novel features and details of this invention are disclosed herein, and in some cases in considerable detail, in order to make the invention clear in at least one of its forms. However, it is to be clearly understood that the invention, as disclosed, is not necessarily limited to the exact form and details disclosed since it is apparent that various modifications and changes may be made without departing from the spirit and scope of the invention.

Having thus described my invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A taping device for elongated elements such as nails, pins, cartridges comprising a rotary carrier means which receives the elements at one portion and delivers the elements at another portion thereof, a plastic bath means intermediate the said portions, said rotary carrier means having an annular channel at the middle portion of its periphery to receive plastic and mold it around the middle portions of the said elements, and means along the sides of the channel for guiding the elongated elements in predetermined spaced apart order.

2. That recited in claim **1** wherein a pressure roller is provided along the said channel for firming the plastic about the elements.

3. That recited in claim **1** wherein the means along the sides of the channel is a plurality of teeth forming pockets into which the element end portions are placed.

4. A device for taping elongated elements such as nails and the like, the device comprising a rotary carrier for the elements wherein the elements are received thereon at one point and rejected at another point remote therefrom, a plastic bath means between the points in contact with the carrier, an annular channel in the periphery of the carrier sized to form the plastic tape, means along the sides of the channel for holding end portions of the elements, and means proximate the channel for firming the plastic around the elements as they pass by on the carrier.

5. The device recited in claim **4** wherein a channel-like guide means is provided for feeding the elongated elements onto the rotary carrier at said one point, and adjustable means spaced along the guide means to provide a suitable size passage therealong to neatly accommodate the thickness of the elongated elements.

6. The device recited in claim **5** wherein the guide means is slanted downwardly to the rotary carrier and wherein the said another point is provided with a scraper means to free the elements from the rotary carrier and direct them from the carrier.

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