March 9, 1965 J. E. ASHWORTH 3,172,565

MACHINE FOR PACKAGING ARTICLES IN PARALLEL

Filed June 18, 1963

FIG. 1

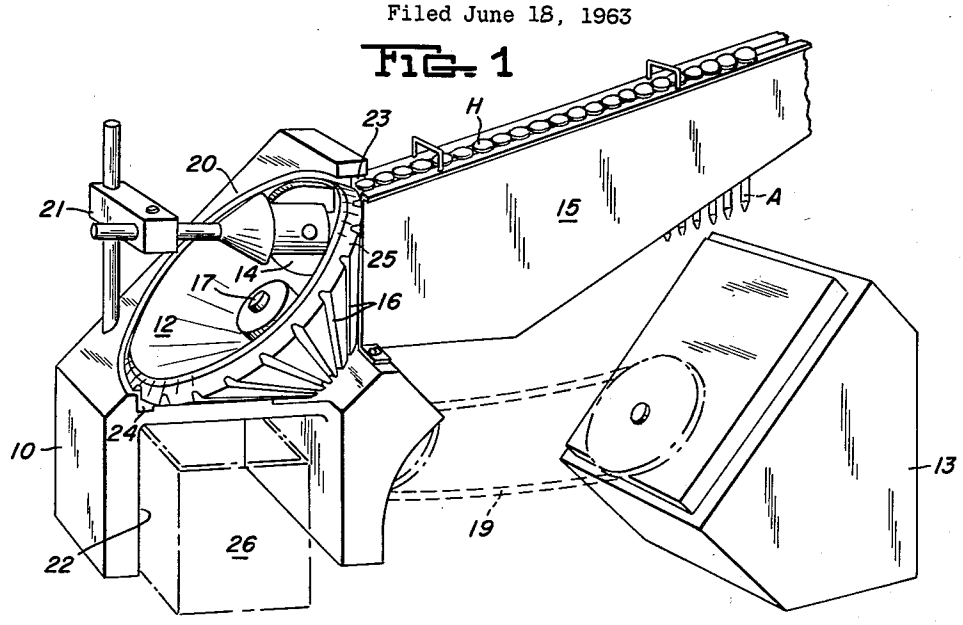


FIG. 2

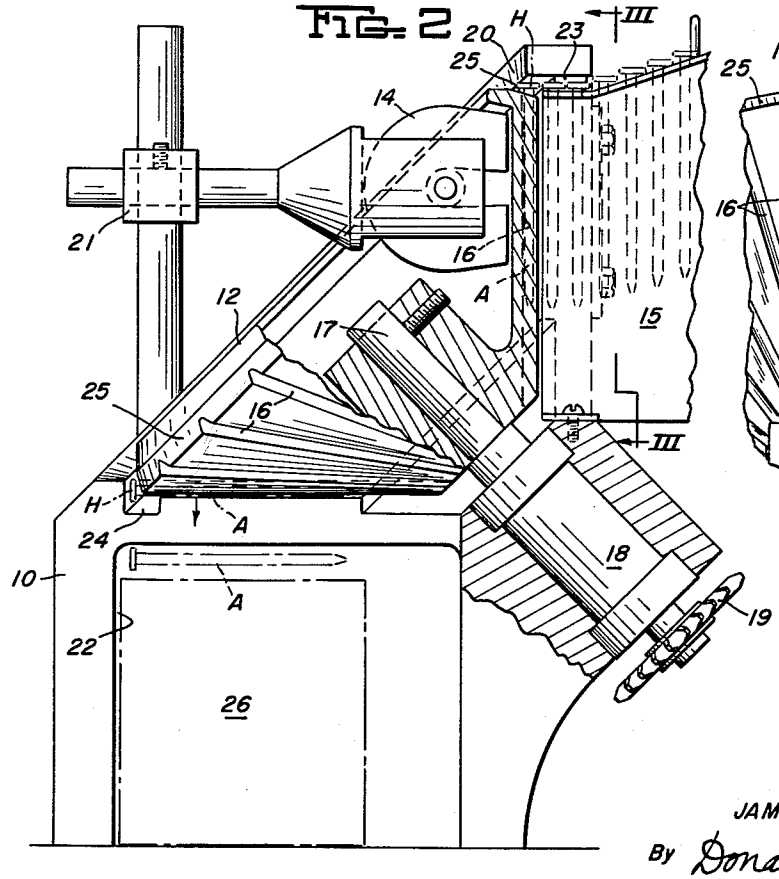
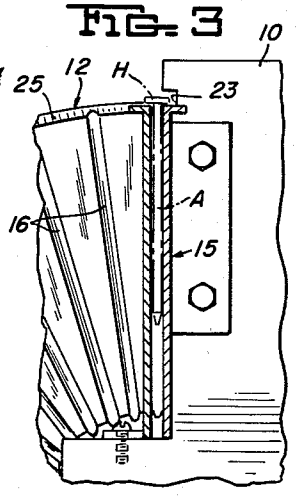


FIG. 3



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3,172,565 MACHINE FOR PACKAGING ARTICLES IN PARALLEL

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This invention relates to an improved machine for positioning elongated articles in parallel for packaging.

An object of the invention is to provide a machine of simplified construction which rapidly and accurately positions elongated articles, such as nails, in parallel and lying horizontally.

A further object is to provide a machine of the foregoing type which avoids the need for high strength electromagnets and the problems incident to periodically energizing and deenergizing such magnets.

A more specific object is to provide a machine of the foregoing type which includes a conical rotor journaled on an inclined axis and adapted to receive elongated articles arranged vertically and lay them down horizontally and in parellel in a package.

In accomplishing these and other objects of the invention, I have provided improved details of structure, a preferred form of which is shown in the accompanying drawing, in which:

FIGURE 1 is a perspective view of a packaging machine constructed in accordance with my invention;

FIGURE 2 is a side elevational view of the machine with parts broken away; and

FIGURE 3 is a fragmentary vertical section on line III—III of FIGURE 2.

The machine comprises essentially a stationary housing 10, a rotor 12 of nonmagnetic material, a drive motor 13 for the rotor, a magnet 14 preferably of the permanent type, and a magazine 15. The rotor 12 is shaped as a hollow frustum of a right cone and it has a plurality of spaced-apart grooves 16 in its conical face extending the length thereof. The rotor is mounted on a shaft 17 which extends downwardly from the smaller end of the frustum. Shaft 17 is journaled in a bearing 18 in housing 10 to rotate on an axis which slopes approximately 45° from both vertical and horizontal. Thus one portion of the conical face is vertical and the diametrically opposite portion is horizontal. The lower end of shaft 17 is operatively connected with the drive motor 13, as with a chain and sprocket mechanism 19, to be driven counterclockwise. Housing 10 has a shroud portion 20 which closely covers approximately half the circumference of the conical surface of the rotor extending counterclockwise from the vertical portion to the horizontal portion. The magnet 14 is mounted on a stand 21 and is positioned within the hollow of the rotor adjacent the upper edge of the shroud. Magazine 15 includes a pair of spaced-apart plates which are attached to the housing 10 opposite the magnet 14, and the upper edges of which slope downwardly toward the rotor. The lower portion of the housing forms an archway 22 beneath the rotor.

In operation, I feed to magazine 15 a succession of elongated articles A which have heads H (for example nails). Suitable feeders for introducing articles to a magazine of this type are well known. They usually include a vibrating hopper and troughs for receiving articles from the hopper and holding them in parallelism. Reference can be made to Kuehlman Patent No. 2,385,141 for a typical showing. The heads H rest on the upper edges of the magazine plates to support the articles. The articles move down the magazine gravitationally and one by one enter grooves 16 in rotor 12. The shroud 20 has a notch 23 at its upper end to accommodate the heads H as the articles enter the grooves (FIGURE 3). Magnet 14 pulls the articles into the grooves initially, and the shroud 20 holds them in thereafter. The shroud has an internal groove 24 and the rotor 12 a beveled edge 25 to accommodate the heads H. I place a box or carton 26 in the archway 22 to receive the articles as the rotor carries them past the lower edge of the shroud. Thus the rotor delivers articles to the box in parallelism and lying horizontally. Normally I use two machines extending in opposite directions from the box, whereby half the articles are packaged with their heads at one end of the box and half with their heads at the other end.

From the foregoing descriptions it is seen that my invention affords a simple machine for laying down elongated articles horizontally and in parallel in a package. The same machine can handle articles of a variety of sizes without changing any parts. The magnet preferably is a simple permanent magnet, overcoming need for circuits to energize and deenergize electromagnets.

While I have shown and described only a single embodiment of my invention, it is apparent that modifications may arise. Therefore, I do not wish to be limited to the disclosure set forth but only by the scope of the appended claims.

I claim:

1. A machine for packaging elongated headed articles in parallel comprising a housing, a nonmagnetic rotor shaped as a hollow frustum of a right cone journaled in said housing to rotate on an axis sloping approximately 45° from both vertical and horizontal with its smaller end down, whereby one portion of the conical face is vertical and the diametrically opposite portion is horizontal, said rotor having a plurality of spaced-apart grooves in its conical face and a beveled surface around the outer circumference of its larger end, drive means operatively connected with said rotor, said housing including a shroud portion which closely covers approximately half the circumference of the conical face of said rotor extending from said vertical portion to said horizontal portion, said shroud portion having a notch at its upper end and an internal groove opposite said beveled surface, a magnet supported within said rotor opposite said vertical portion, and means for introducing articles one by one to the groove in said rotor at said vertical portion as said rotor rotates on its axis, the heads of the articles being accommodated by said notch, internal groove and beveled surface.

2. A machine a defined in claim 1 in which said housing has an archway formed beneath the horizontal portion of the conical face for receiving a container into which the articles are delivered from said first-named grooves.

3. A machine as defined in claim 1 in which said last-named means includes a magazine formed of a pair of spaced-apart plates fixed to said housing adjacent the vertical portion of the conical face, said plates having upper surfaces which slope downwardly toward the conical face, whereby said plates support a succession of headed articles

and allow them to feed gravitationally to said first-named grooves.

4. A machine for packaging elongated headed articles in parallel comprising a housing, a rotor shaped as a frustum of a cone journaled in said housing to rotate on a sloping axis and having a plurality of grooves in its conical face and a beveled surface around the circumference of its larger end, drive means operatively connected with said rotor, said housing including a shroud portion which closely covers approximately half the circumference of the conical face of said rotor, said shroud portion having a notch at one end and an internal groove opposite said beveled surface, and means for introducing headed articles

one by one to the groove in said rotor opposite said notch as said rotor rotates on its axis the heads of the articles being accommodated by said notch, internal groove and beveled surface.

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