United States Patent

[11] 3,587,842

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[73] Assignee **Spotnails, Inc.**
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[54] **CARTRIDGE OF COLLATED FASTENERS**
9 Claims, 4 Drawing Figs.

[52] **U.S. Cl.** **206/56DF**
[51] **Int. Cl.** **B65d 83/02**
[50] **Field of Search** ..... 206/56 (DF), 66

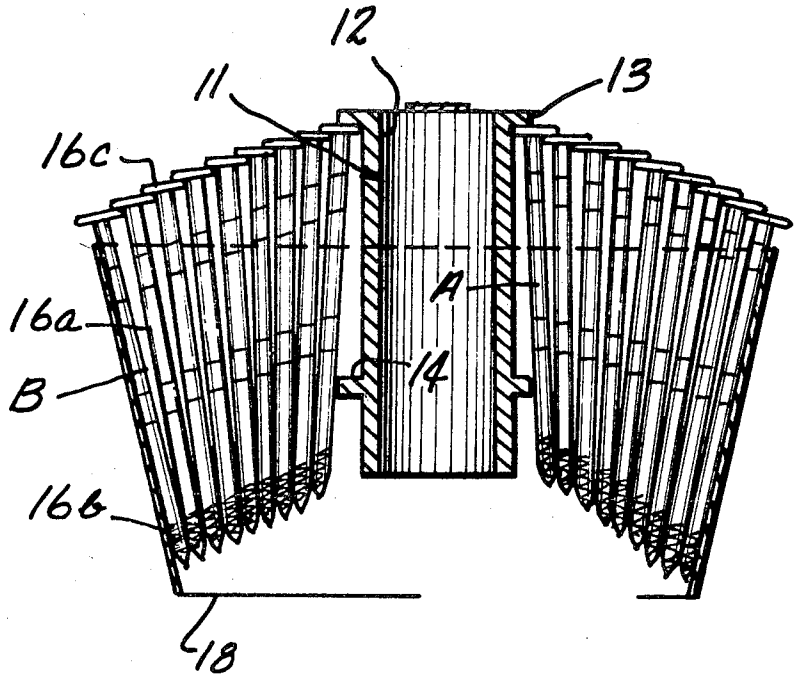
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ABSTRACT: A cartridge of collated fasteners is provided which facilitates the handling of a plurality of fasteners when loading a fastener-driving tool or when said fasteners are to be stored or transported to the job site. The cartridge includes a spool member having an outwardly projecting shoulder adjacent one end and stop means adjacent the other end thereof, a fastener strip snugly coiled about the spool member, a wrapper encompassing the outermost row of fasteners, and removable means overlying a predetermined number of the head ends of the collated fasteners. The head ends of the fasteners are in nested relation and provide a substantially domelike configuration to the upper exposed surface of the cartridge.



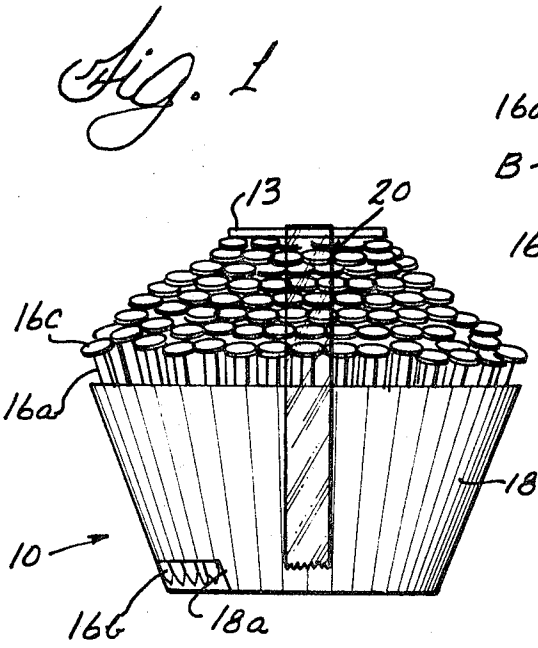


Fig. 1

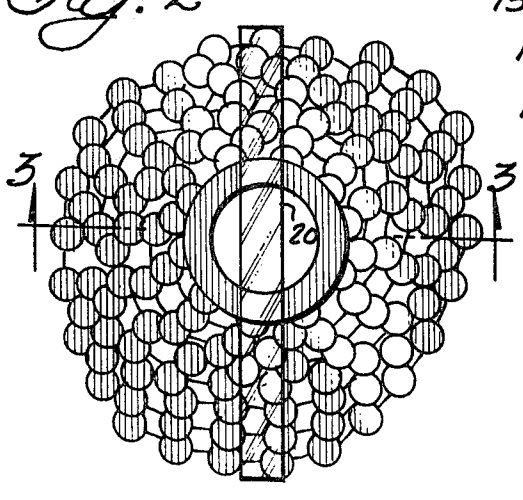


Fig. 2

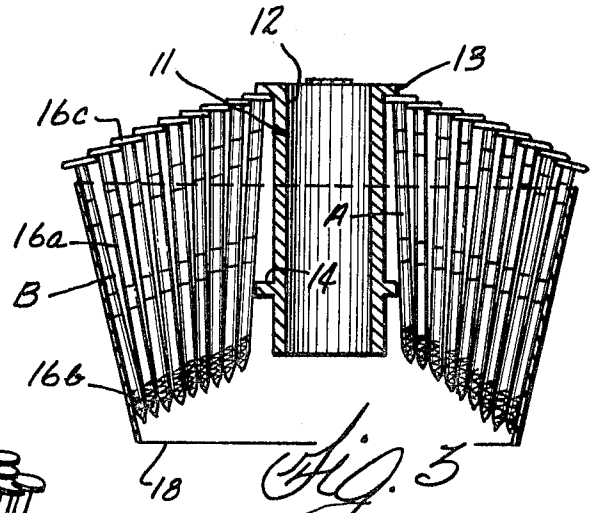


Fig. 3

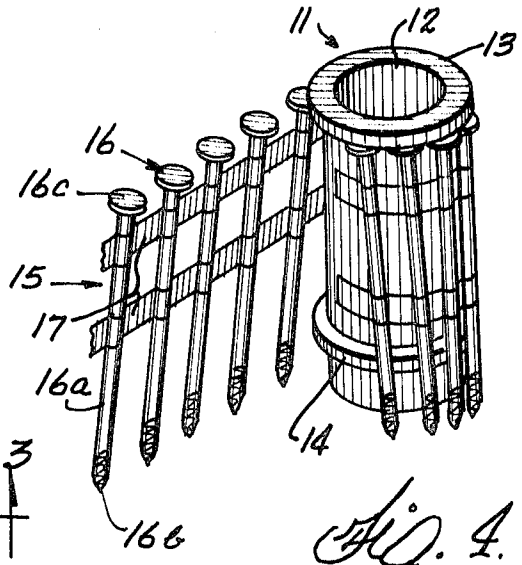


Fig. 4

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CARTRIDGE OF COLLATED FASTENERS

BACKGROUND OF THE INVENTION

Loading and reloading of fastener-driving tools with fasteners, such as nails, have heretofore been an awkward and time-consuming manipulation. In an attempt to rectify this situation the fasteners have been collated by utilizing strips, tapes, wire, etc. Notwithstanding the collation of the fasteners in the manner indicated, problems have still beset the industry due to frequent binding of the collated fasteners within the tool magazine or feed mechanism. In addition to collating the fasteners, the latter were oftentimes arranged in cartridges which were unstable, fragile, awkward to handle, and only accommodated a minimum number of fasteners thereby requiring frequent reloading of the tool particularly when the latter had a high speed operation. Furthermore, high speed feeding of the collated fasteners from the prior cartridges frequently caused jamming of the fasteners within the cartridges themselves.

SUMMARY OF THE INVENTION

Thus, it is an object of this invention to provide a cartridge of collated fasteners which avoids the shortcomings that have beset prior collated fasteners and cartridges thereof.

It is a further object of this invention to provide a cartridge of collated fasteners which enables a large number of fasteners to be accommodated in a compact and simple structure.

It is a still further object of this invention to provide a cartridge wherein the number and size of fasteners comprising the cartridge may vary over a wide range.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In accordance with one embodiment of the invention a cartridge of collated fasteners is provided which includes an elongated cylindrical spool member having an outwardly projecting shoulder adjacent one end thereof and stop means adjacent the other end thereof. Snugly coiled about the spool member is an elongated fastener strip which includes a plurality of fasteners, each having an elongated shank and an enlarged head affixed to one end thereof. The fasteners are arranged in spaced relation and interconnected by a flexible tape. The shanks of the fasteners forming the innermost ring of the coiled strip engage the periphery of the spool member shoulder and the heads of said fasteners abut the stop means. The outermost ring of fasteners in the coiled strip is encompassed by a wrapper and the heads of certain of the fasteners in the coiled strip are engaged by a removable member. The heads of fasteners in each ring of the coiled strip are nested beneath the fastener heads of the preceding ring so that the upper exposed surface of the cartridge is substantially dome-shaped.

DESCRIPTION

For a more complete understanding of the invention reference should be made to the drawing wherein:

FIG. 1 is a side elevational view of one form of the improved cartridge.

FIG. 2 is a top plan view of FIG. 1.

FIG. 3 is a fragmentary sectional view taken along line 3–3 of FIG. 2.

FIG. 4 is a perspective top view showing the fastener strip being uncoiled from the spool member.

Referring now to the drawing, one form of the improved cartridge **10** is shown which includes a hollow cylindrically-shaped spool member **11** formed of suitable plastic or the like. The centerbore **12** of the member **11** is sized to slidably accommodate a suitable spindle, not shown, forming a part of a cannister-type magazine of a fastener-driving tool, also not shown. Tools of the type in question are presently marketed by Spotnails, Inc., a subsidiary of Swingline, Inc., assignee of the present invention.

The spool member **11** is provided at its upper end with an outwardly projecting collar **13** and an annular outwardly projecting shoulder or flange **14**, the latter being disposed adjacent to the lower end of the spool member, as seen more clearly in FIG. 3.

Snugly coiled about spool member **11** is an elongated fastener strip **15**. The strip **15** in this instance comprises a plurality of fasteners **16** which may be nails, screws, rivets, etc. In any case, the fastener **16** has an elongated shank **16*a***, pointed at one end **16*b***, and having preferably an enlarged head **16*c*** at the opposite end of the shank, see FIG. 4. The fasteners are interconnected to one another by flexible tape sections **17**. When the strip **15** is being uncoiled from the spool member **11** and fed into firing position, the tape sections **17** are in taut condition and the fasteners arranged in a substantially parallel relation, see FIG. 4.

The strip **15**, when snugly coiled about spool member **11**, has the shanks **16*a*** of the fasteners **16**, comprising the innermost ring A of the coiled strip, engaging the periphery of flange **14** while the heads **16*c*** of said fasteners abut the underside of collar **13**, see FIG. 3. Collar **13** and flange **14** serve to prevent accidental telescoping of the fasteners from the spool member when the strip **15** is coiled thereabout. It will be noted from the drawing that the fastener heads of each outwardly succeeding ring of the coiled strip are nested beneath and engage the underside of the fastener heads comprising the preceding ring. Thus, the nested fastener heads are in compact interlocking relation and form a domelike, exposed upper surface of the cartridge **10**, see FIG. 1.

The shank ends **16*b*** of the fasteners of each succeeding ring frictionally engage one another, as seen in FIG. 3, and form a concave bottom surface for the cartridge. The shank ends, except for the inner rings of fasteners, are toed inwardly due to the head **16*c*** contacting the shank of a fastener in the preceding ring. Thus, the fastener shanks comprising the outermost ring of the coiled strip impart to the lower exposed part of the cartridge a shape similar to the frustum of a cone with the large end of the cone facing upwardly. The fasteners **16** in the illustrated embodiment have the lead ends **16*b*** thereof color-coded so that the user of the fasteners can tell at a glance the type and size of fastener being used. The color-coding is achieved by an adhesive coating having a distinctive color. The coating in addition to providing a color code, enhances the bonding effect between the fastener and the workpiece into which it is driven.

Surrounding the shanks of the fasteners comprising the outermost ring B of the coiled strip **15** is a sleeve-type wrapper **18** formed of suitable paperboard or the like. The wrapper conforms to the frustum of a cone shape produced by the outermost ring B of the strip. Preferably the wrapper projects a short distance beyond the lead ends **16*b*** of the fasteners and thus, provides a bottom which imparts stability to the cartridge when it is resting upright on a supporting surface.

The lower edge of the wrapper **18** may be provided with a cutout **18*a*** so as to expose some of the color-coded fastener lead ends **16*b***. The wrapper **18** when in assembled position, prevents accidental uncoiling of the strip **15** from the spool member **11**. To retain the wrapper **17** in assembled relation with the coiled strip, a removable straplike member **20** is provided, which snugly overlies certain of the fastener heads **16*c*** forming the dome-shaped exposed upper surface of the cartridge **10**. In the illustrated embodiment the member **20** is a piece of plastic tape adhesively coated on one side. The ends of member **20** are secured to opposite sides of the exposed surface of the wrapper **18**. Other means for retaining the wrapper in its assembled condition may be readily utilized if desired.

When the cartridge is to be loaded into the magazine of a driving tool, not shown, the member **20** is first removed and the spindle of the tool is then inserted into the bore **12** formed in the spool member **11**. Once the spool member is properly seated on the spindle, wrapper **18** is then removed and the outer end of the strip **15** is threaded into the feed mechanism for the tool. The threading of the strip into the feed mechanism is a manipulation well known and understood by those skilled in the art.

The number of fasteners comprising the strip as well as the type and size of fastener utilized may be varied from that shown without departing from the scope of this invention.

Thus, it will be seen that a simple and compact cartridge of collated fasteners has been provided which may be readily manipulated by an operator. The cartridge enables the operator to readily determine the type and size fasteners involved without requiring the cartridge to be disassembled.

I claim:

1. A cartridge of collated fasteners each of the latter having an elongated shank with lead and trailing ends and an enlarged head at the trailing end thereof, said cartridge comprising an elongated spool member provided with an outwardly projecting shoulder adjacent one end thereof and stop means adjacent the other end thereof; a fastener strip snugly coiled about said spool member whereby a predetermined number of heads of the inner ring of fasteners abut said stop means and the shanks thereof snugly engage the periphery of said shoulder, the heads of each ring of fasteners being nested beneath the heads of the preceding ring of fasteners; a wrapper encompassing the elongated shanks of the outermost ring of fasteners; and removable means engaging said wrapper and retaining the latter in encompassing relation with said coiled fastener strip.

2. The cartridge of claim 1 wherein said spool member has a hollow cylindrical configuration and said stop means comprises a collar formed integrally with said spool member exterior.

3. The cartridge of claim 1 wherein the nested fasteners heads cooperate with one another to provide a substantially domelike configuration to the upper exposed surface of said cartridge.

4. The cartridge of claim 3 wherein the wrapper has a substantially frustum of a cone configuration with the large end thereof facing upwardly and terminating beneath the enlarged heads of the outermost ring of fasteners.

5. The cartridge of claim 4 wherein the small end of the wrapper projects beyond the lead ends of the outermost ring of fasteners.

6. The cartridge of claim 1 wherein the lead ends of the fasteners cooperate to form a substantially concave bottom surface for said cartridge.

7. The cartridge of claim 1 wherein said wrapper is of paperboard material and said removable means comprises a frangible strap overlying predetermined fastener heads and having the ends of said strap attached to said wrapper.

8. The cartridge of claim 2 wherein the fastener shanks of the innermost and outermost rings of fasteners are oblique to the axis of the spool member.

9. The cartridge of claim 8 wherein the shanks of the outermost ring of fasteners are toed inwardly relative to the spool.