

July 2, 1968

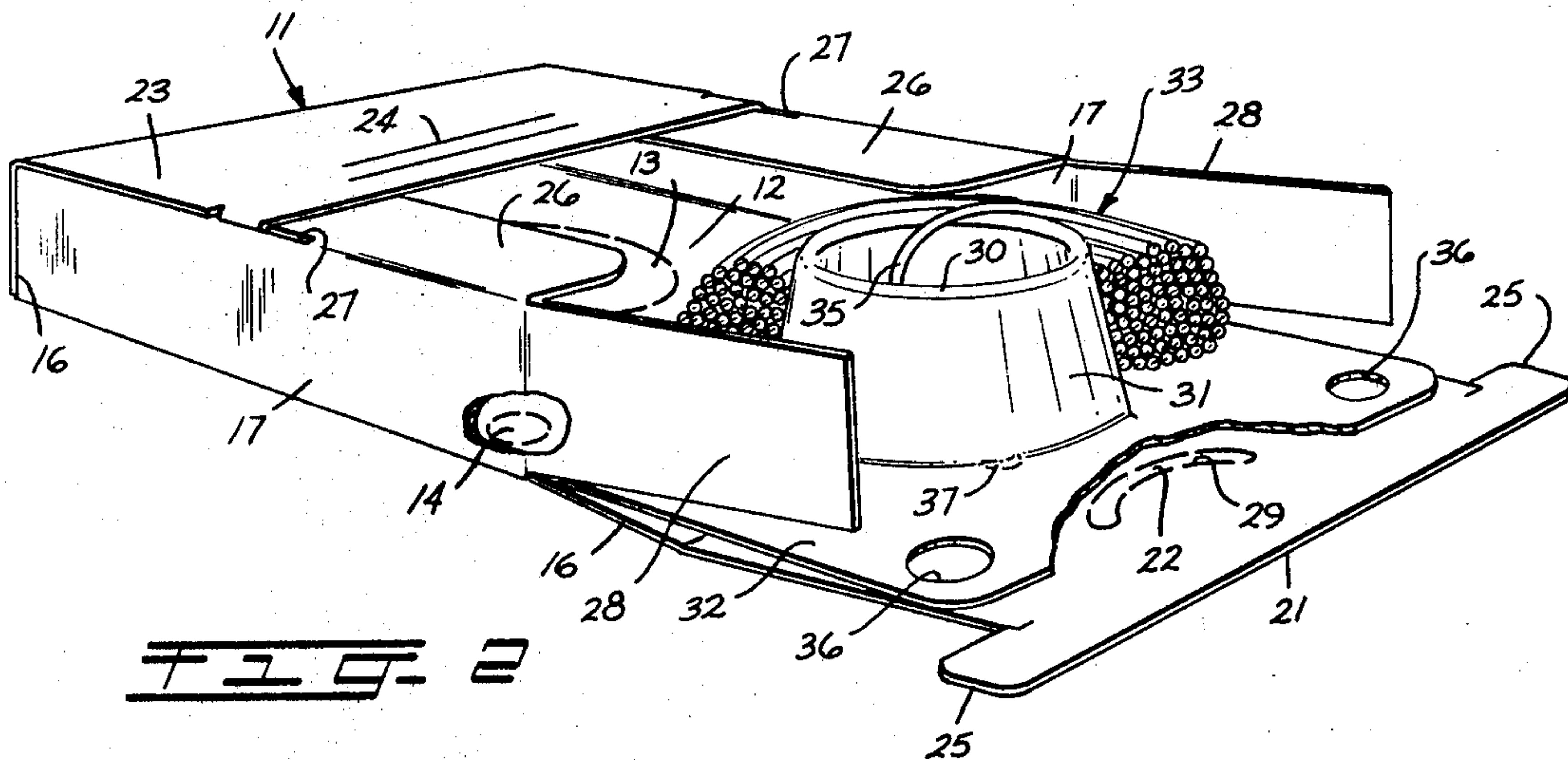
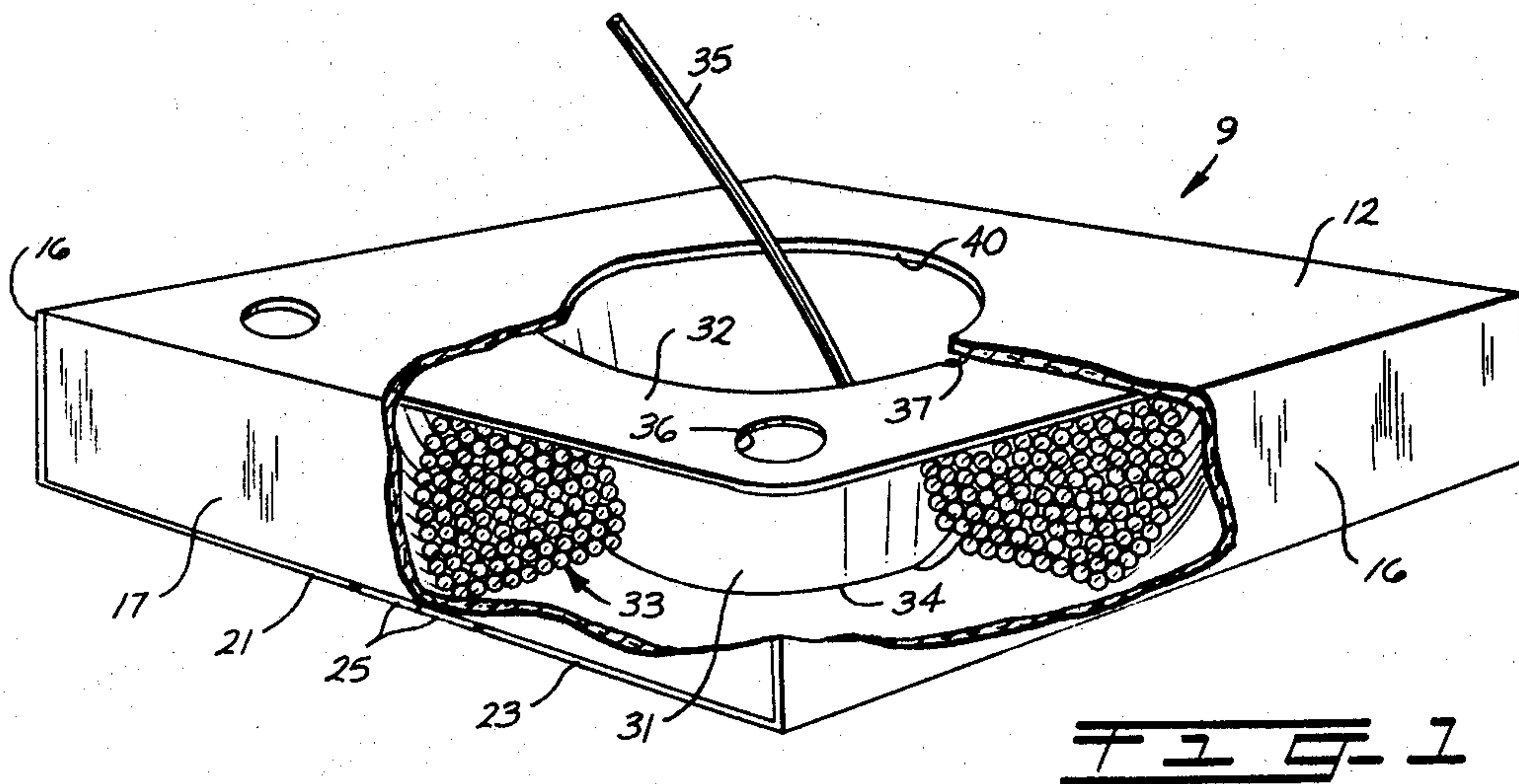
H. M. DILLOW ET AL

3,390,844

DISPENSING PACKAGES FOR COILS OF STRAND MATERIAL

Filed Feb. 27, 1967

4 Sheets-Sheet 1



INVENTORS
H. M. DILLOW
M. L. HUNTOON
By *Don P. Bush*
ATTORNEY

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FIG 3

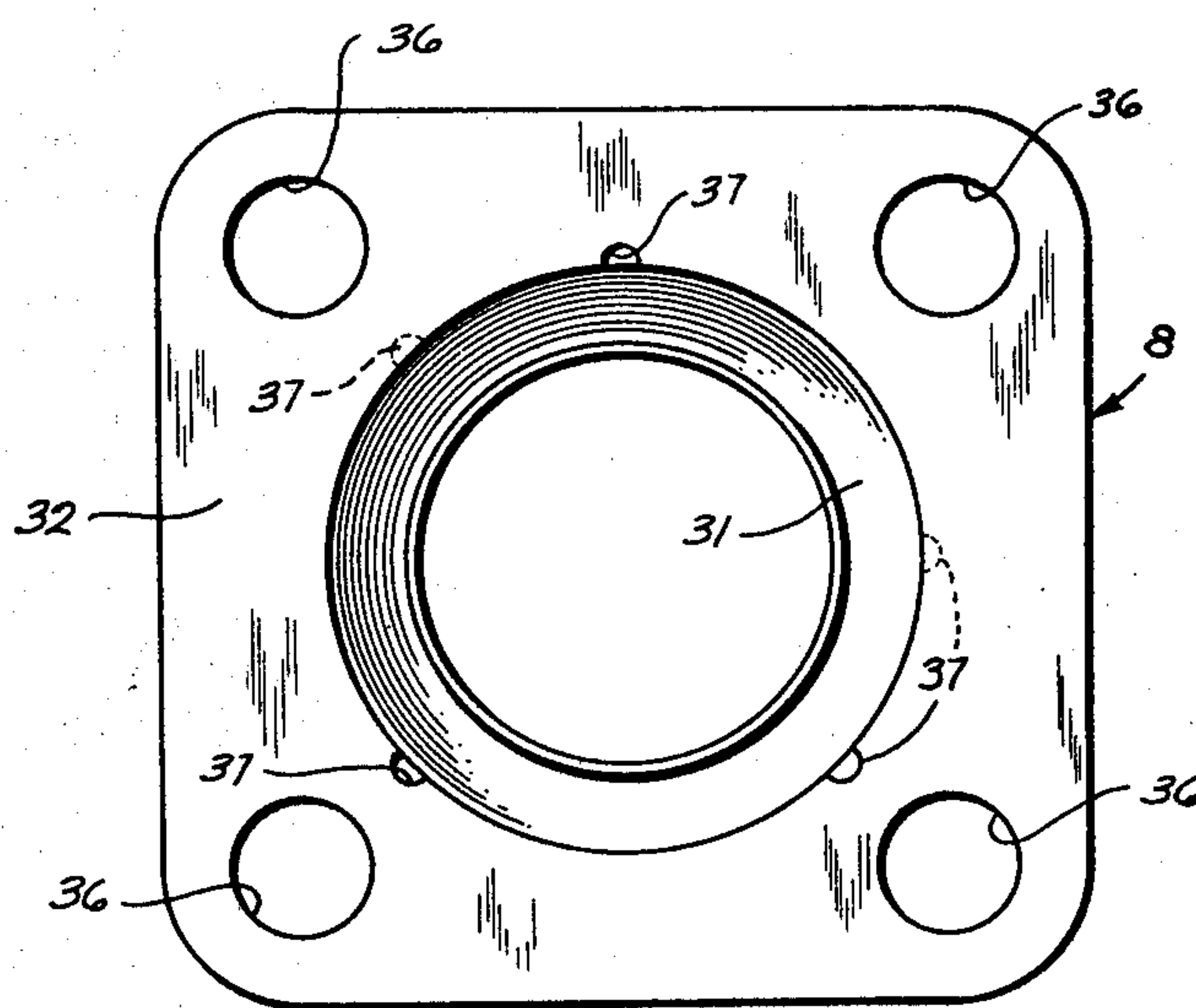
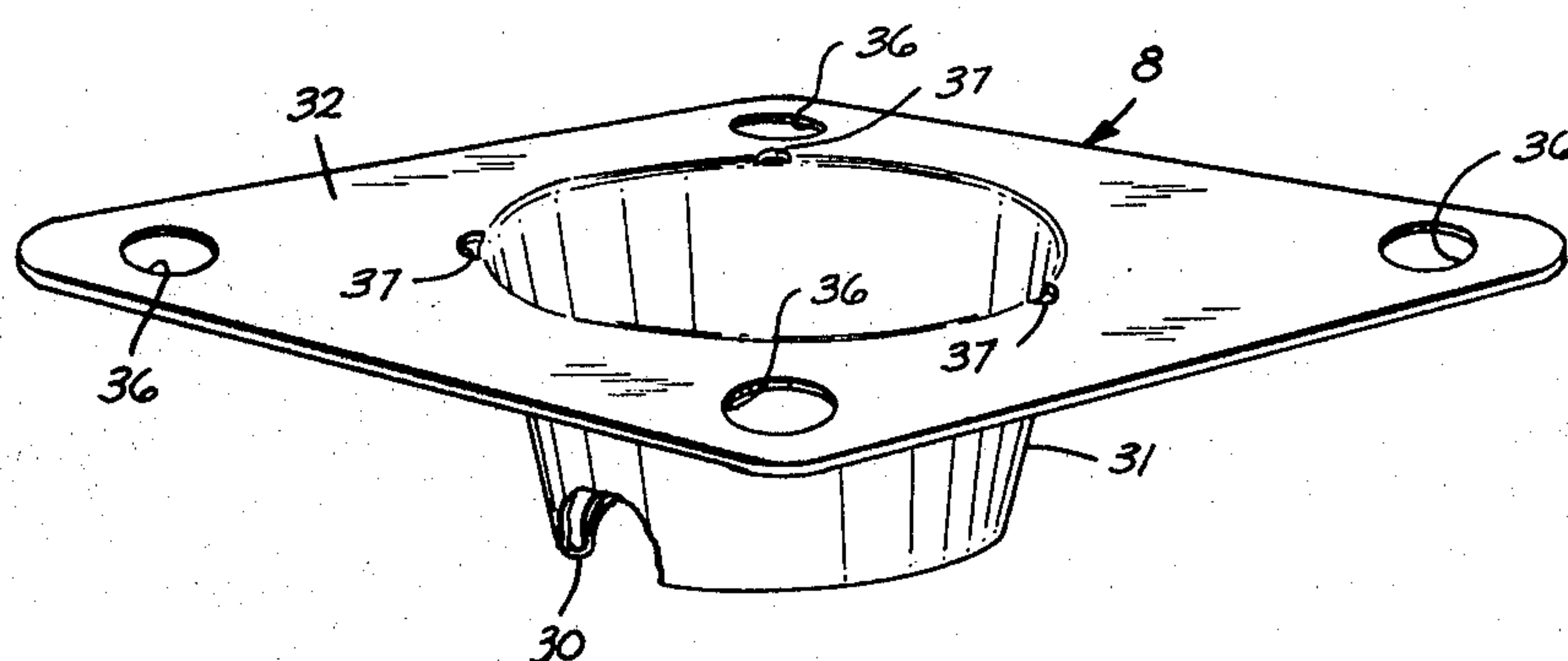


FIG 4

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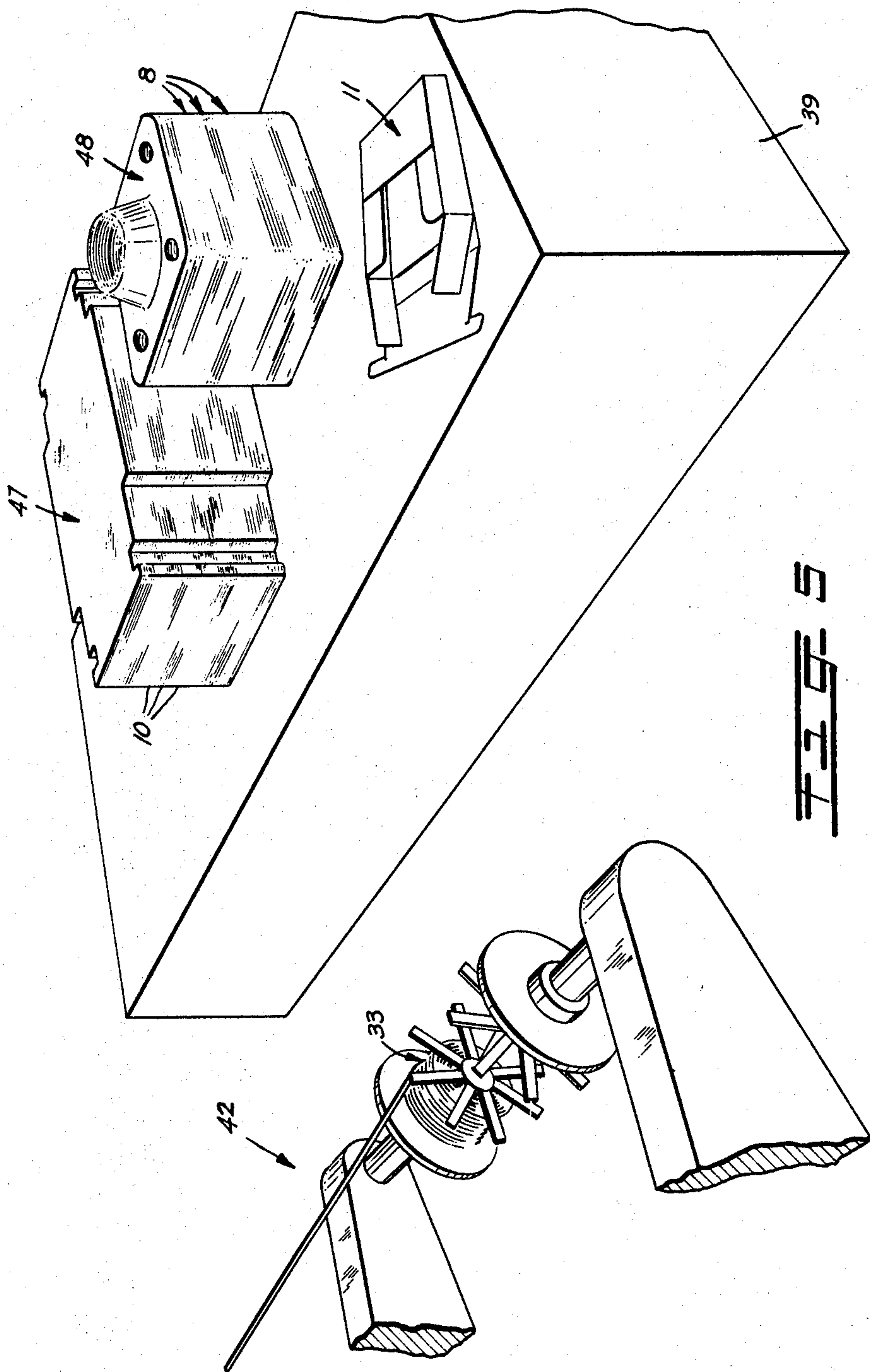
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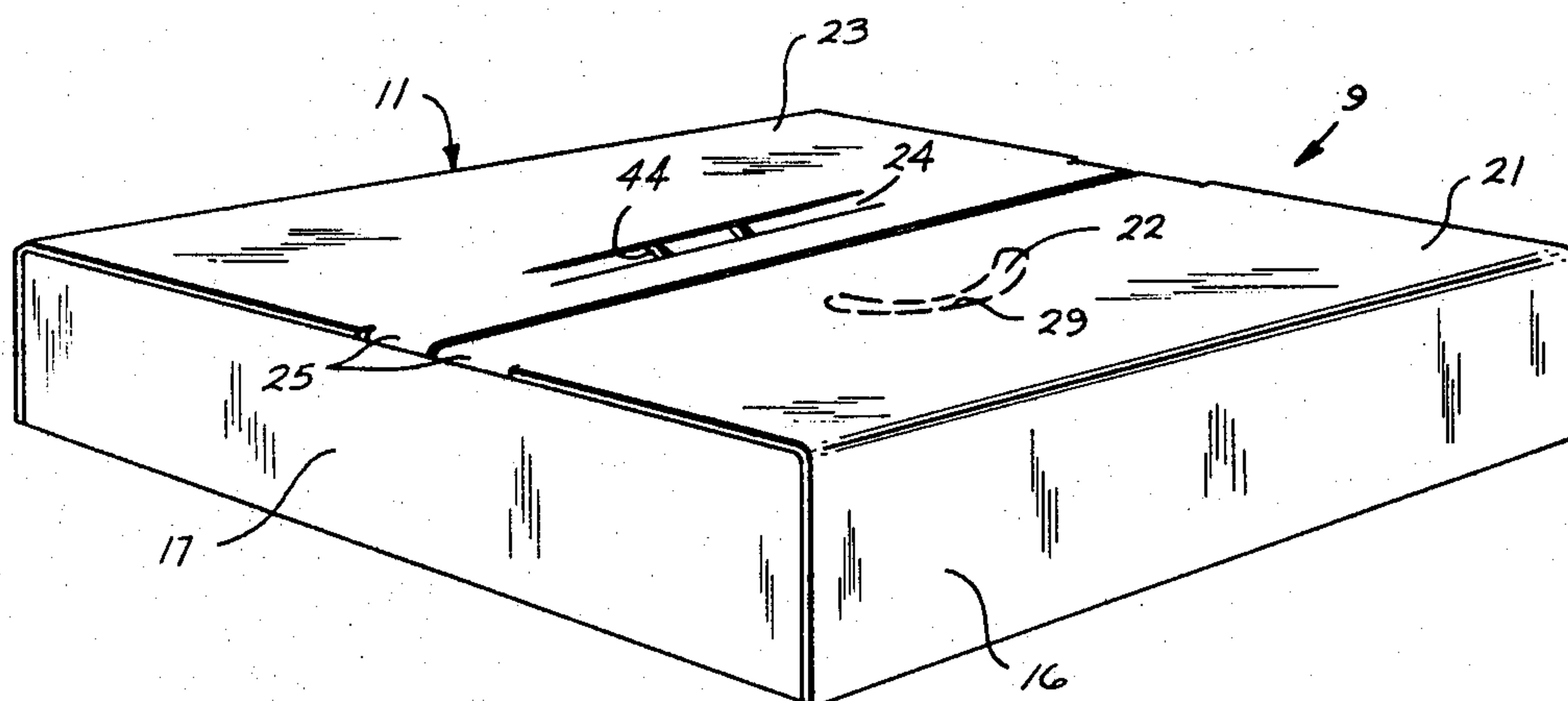


FIG. 6

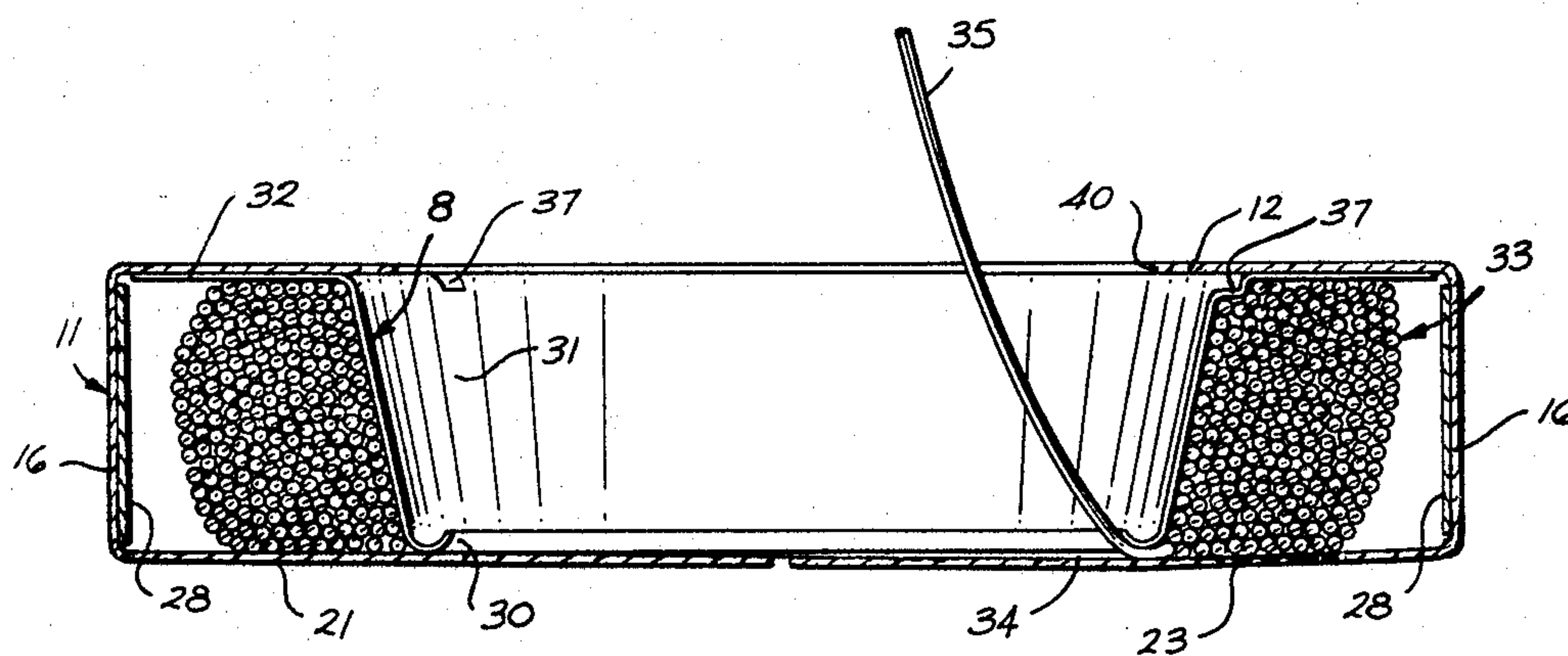


FIG. 7

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DISPENSING PACKAGES FOR COILS OF STRAND MATERIAL

Harry M. Dillow, Perry Hall, and Murray L. Huntoon, Columbia, Md.; said Dillow assignor to Bell Telephone Laboratories, Incorporated, New York, N.Y., and said Huntoon assignor to Western Electric Company, Incorporated, New York, N.Y., both corporations of New York

Filed Feb. 27, 1967, Ser. No. 618,630
10 Claims. (Cl. 242-129)

ABSTRACT OF THE DISCLOSURE

Disposable dispensing packages and carriers for coils of wire which include one-piece, folded, corrugated cardboard cartons having perforated portions which may be removed to form central apertures in the tops thereof, and simple, reversible, molded, hollow, substantially frustoconical, wire coil supporting members. In one embodiment, the coil supporting member is constrained between the top and bottom of the carton. A coil of jacketed, multiconductor wire is placed over the coil supporting member and the leading end of the wire is inserted between the bottom of the carton and the adjacent end of the coil supporting member.

BACKGROUND OF THE INVENTION

(1) Field of the invention

The invention relates to packages for coils of strand material which are capable of being used as dispensers for the strand material.

(2) Description of the prior art

Devices which are capable of functioning as disposable packages for coils of wire and which can be used both as carriers and tangle-free type dispensers for the wire are well known. However, a recent development in the field of telephone station wire has precipitated a further refinement in the packages used for this wire. The new wire is described in a pending application Ser. No. 613,188, filed on Feb. 1, 1967, in the names of N. J. Cogelia, S. M. Martin and R. B. Ramsey. This improved wire is considerably more flexible than the previously used telephone station wire and it is this particularly flexible wire that the subject package must properly dispense as an unassisted craftsman pulls the wire into a conduit from some remote location.

It is also desirable that the package fit an existing manufacturing and packaging scheme wherein only one wire packaging operator performs the operations of wire removal from a continuous take-up, wire inspection, package assembly and wire packaging at the same work location on a continuous basis as the wire is processed.

The existence of a large number of package parts, of difficult-to-store configuration, would have encumbered the packaging operator in the performance of his duties and, of course, a higher packaging cost would have resulted. Therefore the subject, simple, easily stackable, cartons and coil supporting members were developed.

SUMMARY OF THE INVENTION

An object of the invention is to provide new and improved packages and carriers for wires or other strand material which can be utilized to accomplish the dispensing of such material in a tangle-free state.

Another object of the invention is the provision of such packages which can be constructed from single sheets of pre-cut cardboard and simple molded members.

A further object of the invention is the provision of

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such packages which, in thus being formable from two simple components of stackable configuration, are adaptable to a wire manufacturing process wherein a single worker may perform the operations of removing the wire from a continuous take-up, assembling the packages, inspecting the wire, and packing the wire, on a continuous basis.

A dispensing package for a coil of strand material of indefinite length, embodying certain features of the invention, may include a carton for surrounding the top, bottom and outer periphery of a coil of strand material of indefinite length and having an opening in one side thereof, and an inner, hollow, open ended, coil supporting member adapted to be positioned within the confines of the coil substantially coaxially of the opening in the carton and having its open ends adjacent to opposite sides of the carton. The carton and the coil supporting member are so constructed and assembled to allow relative movement between the carton and the coil supporting member to the extent of allowing the passage of successive portions of the strand material between a portion of the carton and the adjacent end of the coil supporting member while maintaining a snubbing force on the successive portions of the strand sufficient to substantially confine the relative movement of the portions of the strand as they are removed from the coil and pass between the associated end of the coil supporting member and the adjacent portion of the carton so that the successive portions of the strand being pulled from the package are tangle free.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and features of the present invention will be more readily understood from the following detailed description of a specific embodiment thereof, when read in conjunction with the appended drawings, in which:

FIG. 1 is a perspective view of the dispensing package with a portion of the package broken away to illustrate a multiconductor jacketed wire, represented schematically as a single strand, being dispensed from an aperture formed in the top of the carton by having a section thereof removed therefrom;

FIG. 2 is a perspective view of the package in the partially assembled form showing a coil of wire, represented schematically as a coil of single strand, and a coil supporting member ready for insertion into the package;

FIG. 3 is a perspective view of a coil supporting member with a portion broken away to show a semitoroidally shaped portion at an end thereof opposite a flanged portion;

FIG. 4 is a plan view of two stacked coil supporting members showing an anti-jamming feature in their design;

FIG. 5 is a perspective schematic view of a work area where the packages are assembled and packed;

FIG. 6 is a perspective view of a completely assembled and filled package; and

FIG. 7 is a horizontal cross-sectional view of a filled package in a vertical position showing a portion of the wire being removed which is subjected to the constraint of the snubbing feature of the package design.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings and more particularly to FIGS. 1 and 2 thereof, there is shown a package, designated generally by the numeral 9, including a coil supporting member, designated generally by the numeral 8, and a carton, designated generally by the numeral 11. The carton 11 is made from a die-cut, integral blank 10 (FIG. 5) of corrugated cardboard which has been wave-ruled on all edges, and properly scored and perforated to

form various elements of the carton. A top 12 of the carton 11 is formed in substantially the center of the blank 10 and a wire removal knockout 13 and an inspection knockout 14 are perforated in the portion of the blank from which the top of the carton 11 is formed.

At all four edges of the top 12 of the carton 11, there are attached hingedly carton sides 16—16 and 17—17. On one of the carton sides, 16—16, there is attached hingedly a bottom flap 21 in which a handle knockout 22 has been perforated. On the opposite carton side 16, there is hingedly attached a bottom flap 23 into which a wire locking tab 24 has been cut. Each of the bottom flaps, 21 and 23, has two locking tabs 25—25 formed on its corners.

The two carton sides 17—17 each have attached hingedly to them an inner bottom flap 26 which is radiused on its corners to facilitate packing. Locking slots 27—27 are centrally located on the lines of intersection of the inner bottom flaps 26—26 and the adjacent carton sides 17—17. The locking slots 27—27 receive the locking tabs 25—25 when the carton 11 is folded and formed. Additionally, there are stiffening flaps 28—28 attached hingedly to the ends of the carton sides 17—17. These stiffening flaps 28—28 serve as load bearing members to distribute the load of a coil, designated generally by the numeral 33, of jacketed multiconductor wire 35 uniformly through the carton sides 16—16 and 17—17 and prevent overloading of the locking tabs 25—25 when the package 9 is carried by its handle 29.

Referring now to FIGS. 1 and 3, and in particular to FIG. 3, there is shown the one-piece coil supporting member 8 which forms a part of the package 9. The coil supporting member 8 is vacuum formed and cut from a sheet, approximately .028" thick of relatively high impact polystyrene such as "Styron 475," manufactured by Dow Chemical Company, or other suitable material. The material from which the member 8 is formed is compatible with the constituents of the polyvinyl chloride material used as a jacketing compound in the wire 35. The polyvinyl chloride material is disclosed in greater detail in the above identified Cogelia et al. application. In particular it is important that the coil supporting member 8 material be relatively sulphur free. Other suitable methods and materials for forming the coil supporting members 8—8 might include injection molding or spin casting of polystyrene or other thermoplastic material or molding wood pulp.

The coil supporting member 8 includes a hollow, frustoconically shaped, core 31 and a relatively flexible flanged portion 32 formed at the base of the core. The core 31 has a diameter, at its flanged end of approximately 8 inches, which is substantially the same as the inside diameter of the coil 33 of the wire 35 to be packaged. The other end of the core 31 has a smaller diameter, approximately 7 inches, and the core is tapered at an angle of approximately 82 degrees, with respect to the plane of the flanged portion 32. The tapering of the core 31 allows the coil supporting members 8—8 to be nested into each other when they are stacked in the manner shown in FIG. 4. The taper in the core 31 is also sufficient to reduce the forces required to pull successive portions of the wire 35 from the coil 33 and along the surface of the core 31. At the small diameter end of the core 31 there is a semitoroidally shaped portion 30 formed integrally with the core. This semitoroidally shaped portion 30 serves as a smooth lead out surface for the wire 35 as the wire is withdrawn from the package 9.

The dimension between the outer surface of the flanged portion 32 of the coil supporting member 8 and the outer surface of the bottom of the semitoroidally shaped portion 30 of the coil supporting member is approximately 2½ inches which is substantially the same as the inside depth of the carton 11 when the carton is formed. This dimensional relationship creates a frictional interface 34 which acts as a wire restraint as the wire 35 is pulled be-

tween the end of the core 31 and the carton 11. Slight relative movement between portions of the carton 11 and portions of the coil supporting member 8 occurs when the wire 35 passes between the bottom of the carton and successive sections of the coil supporting member. This relative movement develops from a combination of either the top or bottom of the carton 11 deflecting or distorting the coil supporting member 8 moving with respect to the carton and actual distortion or deflection of the coil supporting member itself.

In order to facilitate deflection of the coil supporting member 8, it is advantageous to make the flanged portion 32 of the member flexible and slightly convex, as viewed from the small end of the core 31. Any element of this relative movement may be missing in particular orientations of the package 9. For instance, if the bottom of the package 9 is resting on a horizontal support, the bottom of the carton 11 would not be deflected but other elements of the relative movement might occur. The distortion or relative movement is sufficient to permit axial and lateral movement of successive portions of the wire 35 being removed from the carton 11 but the relative movement is restricted enough so that all of the wire is uncoiled and tangles and kinks are prevented from being formed in the wire as the wire is being pulled from the carton. Thus, the successive portions of the wire 35 being removed from the package 9 are maintained in a tensioned, tangle-free state.

The wire removal knockout 13 of the carton 11 is approximately 7 inches in diameter which is approximately the diameter of the small end of the core 31 and will permit the coil supporting member 8 to be inverted with respect to the carton if it is desirable to use these same components to make a package 9 for use with stiffer wire. In that event, in addition to the usual snubbing action of the wire 35 on the core 31 a snubbing action on the wire will occur between the small end of the core and the portion of the carton 11 forming a wire removal port 40.

The flanged portion 32 has radiused corners and at each of the corners there are inspection holes 36—36 of substantially the same size as the inspection knockout 14 in the carton top 12. The inspection holes 36—36 in the flanged portion 32 are located in such positions that when the coil supporting member 8 is placed in the carton 11, one of the four inspection holes will be aligned with the inspection knockout 14 in the carton top 12, irrespective of which side of the flanged portion is introduced initially into the carton.

Referring now to FIGS. 3 and 4 there is shown a circular intersection between the flanged portion 32 and the core 31 of the coil supporting member 8 on which there are molded three substantially, semicylindrical projections 37—37. Two of the semicylindrical projections 37—37 are spaced 90° apart and the third is spaced at 135° from either of the other projections. When the coil supporting members 8—8 are stacked, each member is rotated axially 90° from the one under it (FIG. 4) and in this manner the semicylindrical projections 37—37 are made to rest on the flanged portion 32 below and a space always exists between the cores 31—31 of the nested coil supporting members. Thus the coil supporting members 8—8 will not jam together when stacked and can be removed easily from one another. In order to facilitate separation of the members 8—8, the inner surface of each of the coil supporting members are provided with a matte finish while the outer surface is made smooth and this difference in texture prevents clinging of the members. The smooth surface facilitates sliding of the wire 35 along the outside surface of the core 31.

Referring now to FIG. 5, there is shown a schematic view of a work area which includes a continuous type coiling device, designated generally by the numeral 42, of a wire jacketing machine, not shown. An operator working in this area would have available, in reasonably close

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proximity to the coiling device 42, a packing table 39 supporting a stack, designated generally by the numeral 47, of unfolded blanks 10—10 and a stack, designated generally by the numeral 48, of nested coil supporting members 8—8.

A person functioning as a wire packaging operator would, in performing his job, follow a routine consisting of taking one of the blanks 10—10 and forming one of the cartons 11—11 as shown in FIG. 5, picking up one of the coil supporting members 8—8 and placing it, flange down, on the unfolded bottom flap 21 of the partially formed carton, reaching back to the coiling device 42 and removing one of the coils 33—33 of the wire 35, repositioning the coiling device, cutting off a short piece from both ends of the wire of the coil, visually inspecting the new ends of the wire in the coil to insure that all of the conductors of the wire are present and properly sequenced, placing the coil around the core 31 of the coil supporting member, as shown in FIG. 2, placing the inner end 44 of the wire into the wire locking tab 24, as shown in FIG. 6, sliding the coil supporting member and coil of wire into the carton, folding and locking the carton into its final shape, as shown in FIG. 6, and removing the filled package 9 to a temporary storage area, not shown.

The coil 33 is placed on the core 31 in such a manner that the inherent twist placed in the wire 35 as the wire is withdrawn from the package 9 will loosen the twist in the conductors of the wire and make the wire more flexible. After completing the sequence of operations, the wire packaging operator must immediately repeat the routine in order to keep up with the continuous wire jacketing operation.

Referring now to FIGS. 1, 2 and 7 and in particular to FIG. 7, it is seen that, in the use of the wire dispensing package 9 by a craftsman, the wire removal knockout 13 and the inspection knockout 14 are removed from the top 12 of the carton 11, the inner leading end 44 of the wire 35 is removed from the wire locking tab 24 by the craftsman and successive portions of the wire are pulled from the coil 33, around the end of the coil supporting member 8 in a retroflexed path, and out of the package 9 through the wire removal port 40.

The package 9 described above will function properly to dispense tangle-free wire 35 irrespective of the orientation of the package. This freedom from an orientation requirement allows the package 9 to remain in any position while the craftsman goes to a remote location to pull the wire 35 into a conduit.

In the above-described embodiment the frictional force on the wire 35 is controlled in part by a deflection in the carton bottom portion of the frictional interface 34, and the bottom of the carton 11 is of a split configuration, consisting of the two bottom flaps, 21 and 23 which are folded and locked into position. However it is obvious that the bottom of the carton 11 could consist of an unbroken sheet, in which case closure of the carton could take place at one of the sides or the top.

The term "coil supporting member" 8 as employed in the specification and the following claims, will be understood to refer to either a separate member which can be placed separately in the package 9 or to a member formed integrally with the carton 11 to form a coil supporting component of a one-piece package.

Even though the term "carton" 11, as used in the packaging industry, generally refers only to an enclosure which has at least one of its elements glued in place, the term "carton" as used in the specification and the following claims, will be understood to refer to any form of enclosure.

It is to be understood that the above described arrangements are simply illustrative of the invention. Other arrangements may be devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A dispensing package for a coil of strand material of indefinite length which comprises:

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a carton for surrounding the top, bottom and outer periphery of a coil of strand material of indefinite length and having an opening in one side thereof, and

an inner, hollow, open ended, coil supporting member adapted to be positioned within the confines of the coil approximately coaxially of the opening in the carton and having its open ends adjacent with opposite sides of the carton,

the carton and the supporting member being so constructed and assembled to allow relative movement between at least portions of the carton and the coil supporting member to the extent of allowing the passage of successive portions of the strand material between the carton and the adjacent end of the coil supporting member while maintaining a snubbing force on the successive portions of the strand sufficient to substantially confine the lateral and longitudinal movement of the successive portions of the strand as they are removed from the coil and pass between the associated end of the coil supporting member and the adjacent side of the carton so that the strand material being pulled from the package is tangle free.

2. The dispensing package of claim 1 wherein the coil supporting member is flexible to allow for the relative movement between the carton and the coil supporting member.

3. The dispensing package of claim 1 wherein the carton is flexible to allow for the relative movement between the carton and the coil supporting member.

4. The dispensing package of claim 1 wherein the carton is formed from an integral blank which has been processed to form:

a top which comprises a substantially centrally located removable portion which when removed forms a wire-removal port, and a second removable portion which when removed forms an inspection port, four sides affixed hingedly to the top, and two flaps affixed hingedly to two of the aforementioned sides, which flaps, when closed, substantially cover the bottom of the package.

5. The dispensing package of claim 1 wherein means are provided for holding the leading end of the coil of strand material accessible to a user of the package.

6. The dispensing package of claim 1 wherein the coil supporting member is reversible, and has a core which is substantially frustoconical in shape; which core is provided with an axial dimension approximately the same as the inside depth of the formed carton, said core having at one end a cross sectional dimension approximately the same as the dimension of the opening in the coil of strand material to be packaged.

7. The dispensing package of claim 6 wherein the coil supporting member is provided with a flanged portion of substantially the same size as the top of the carton, said flanged portion being flexible and attached integrally to one end of the core.

8. The dispensing package of claim 7 wherein the coil supporting member is provided with a smooth strand material lead out surface formed on the end of the core opposite the flanged end, said surface being adjacent to the side of the carton opposite the opening.

9. The dispensing package of claim 7 wherein the coil supporting member is formed from a sheet of relatively high impact polystyrene material approximately 0.028 inch thick, and is provided with projections formed at the intersection of the flanged portion and the core, the projections being of such size and so arranged as to serve as separators for the flanged portions of the members to obviate jamming of the cores within one another when a number of the coil supporting members are stacked together.

10. The dispensing package of claim 9 wherein the

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carton is provided with an inspection port in the top thereof, and

wherein the coil supporting member is provided with: four holes in the flange portion thereof, said holes being of substantially the same size as the inspection port in the top of the carton and said holes being in such position that, when the coil supporting member is placed in the carton with the flange adjacent to the inside surface of the top of the carton, one of the four holes will lie directly under the inspection port irrespective of which side of the coil supporting member is first placed in the carton,

a matte finish on the inside surface of the core thereof, and

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a smooth surface on the outside surface of the core thereof, so that the cooperation of adjacent inner and outer surfaces help to eliminate clinging of successive coil supporting members being removed from a stack of the coil supporting members, and facilitate separation thereof.

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LEONARD D. CHRISTIAN, *Primary Examiner.*