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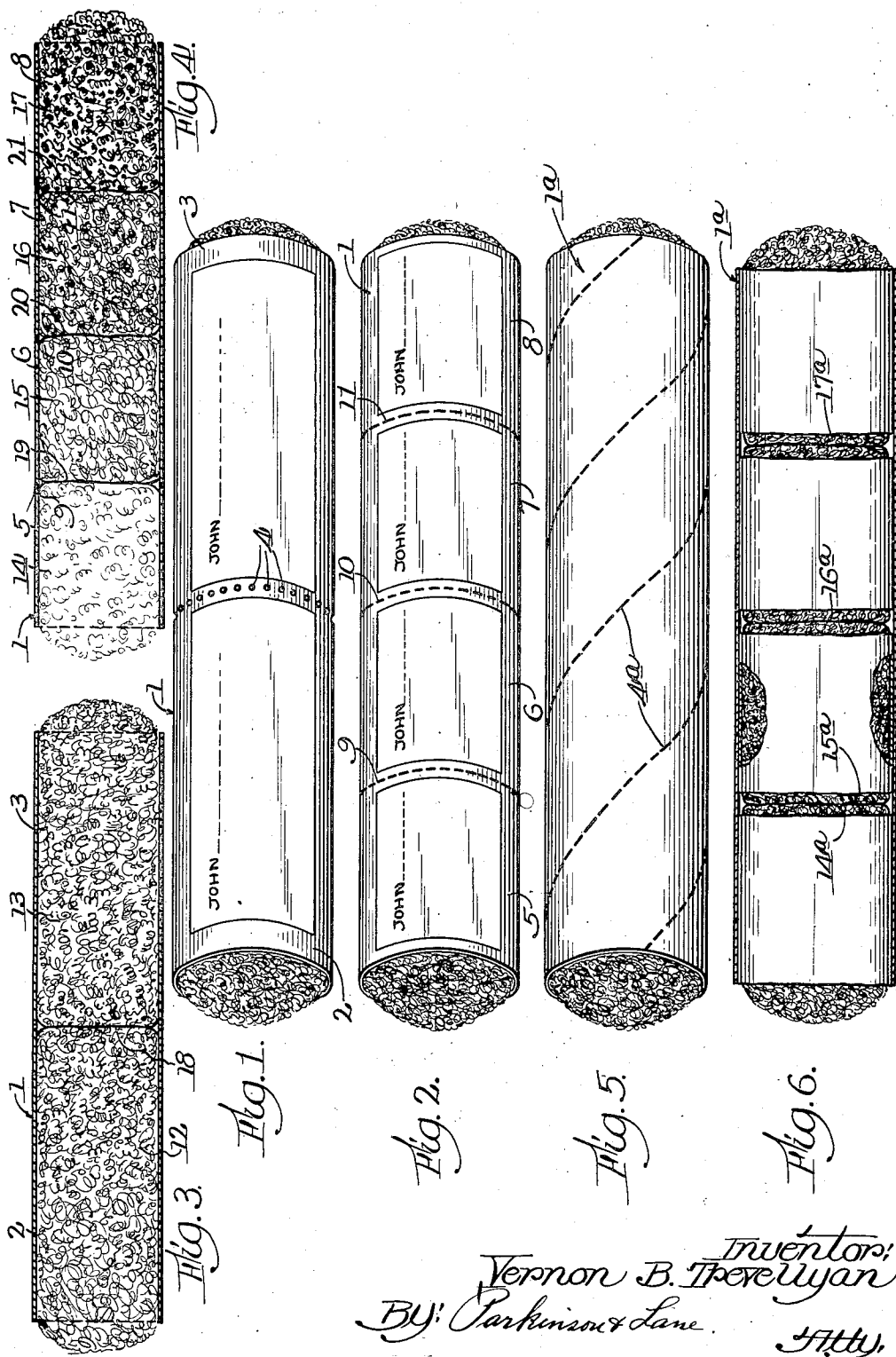
V. B. TREVELLYAN

2,057,121

PACKAGING OF FIBROUS MATERIALS

Filed Sept. 8, 1933

5 Sheets-Sheet 1



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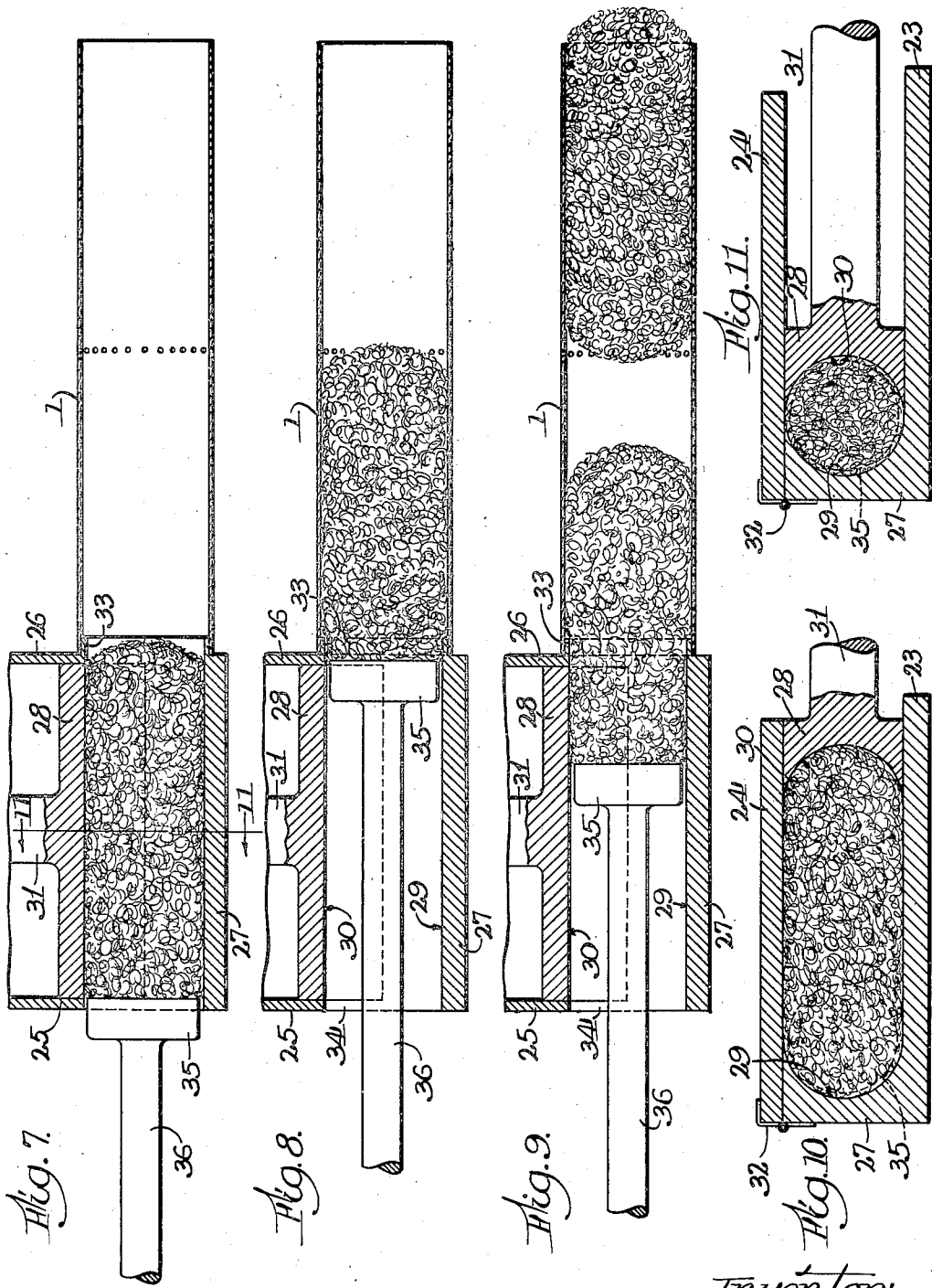
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5 Sheets-Sheet 2



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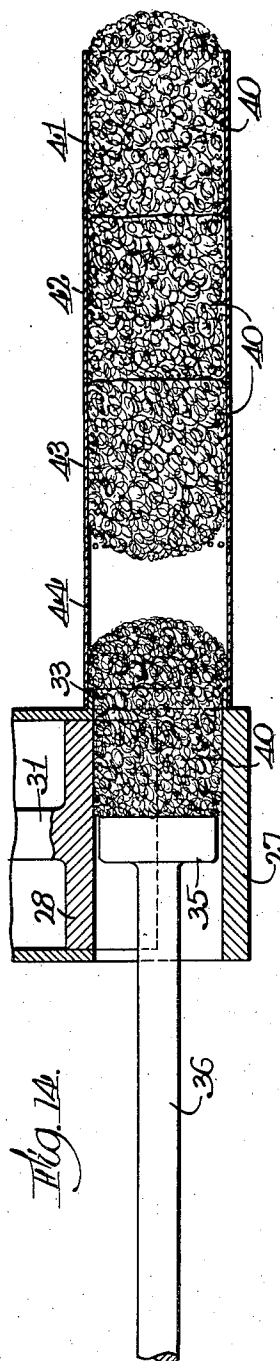
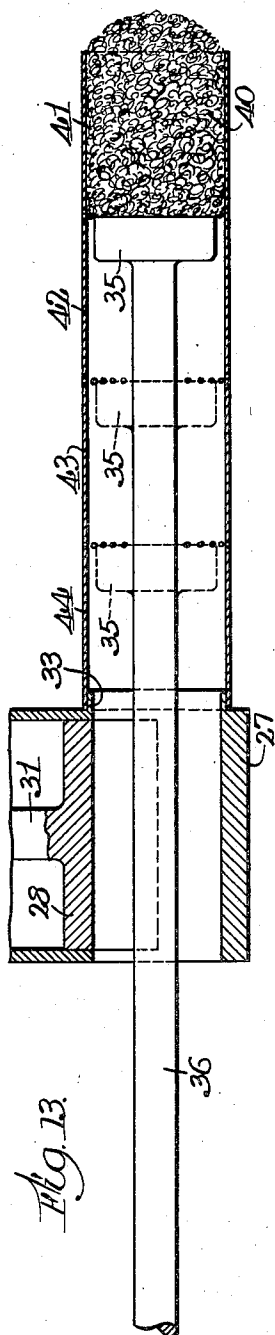
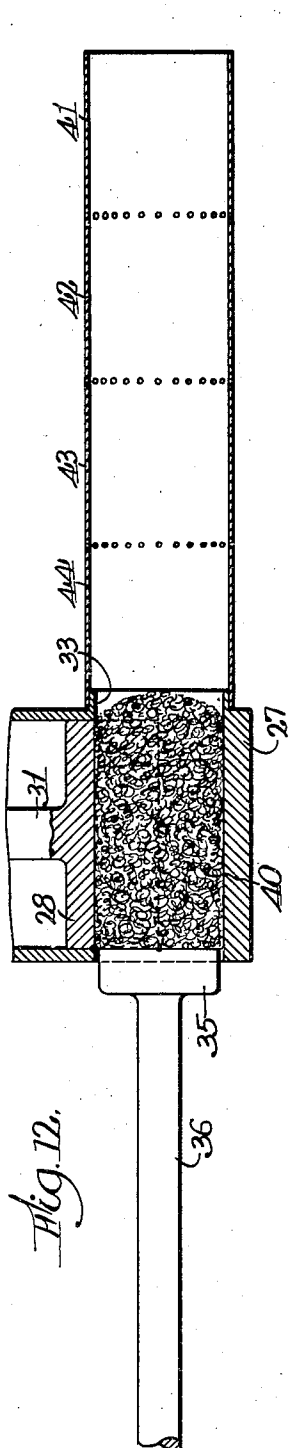
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PACKAGING OF FIBROUS MATERIALS

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5 Sheets-Sheet 3



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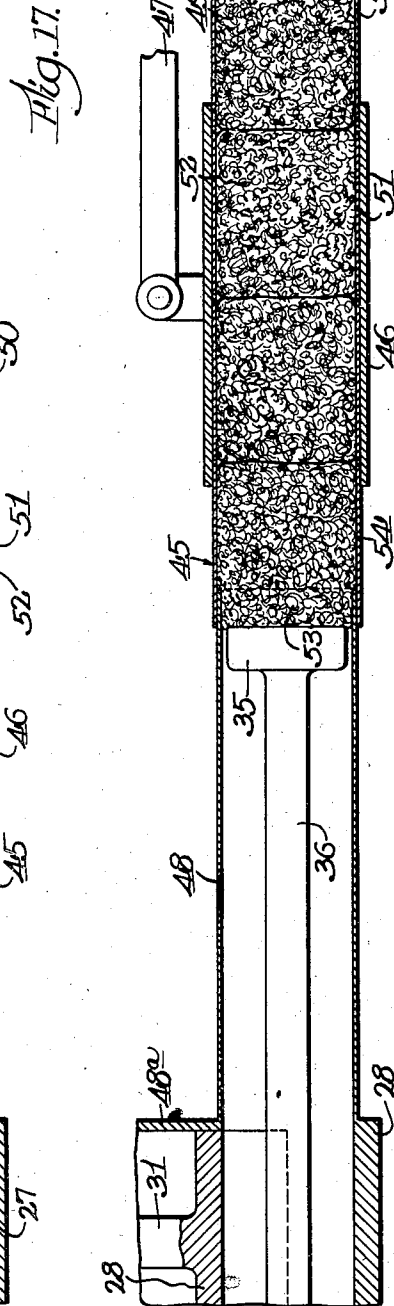
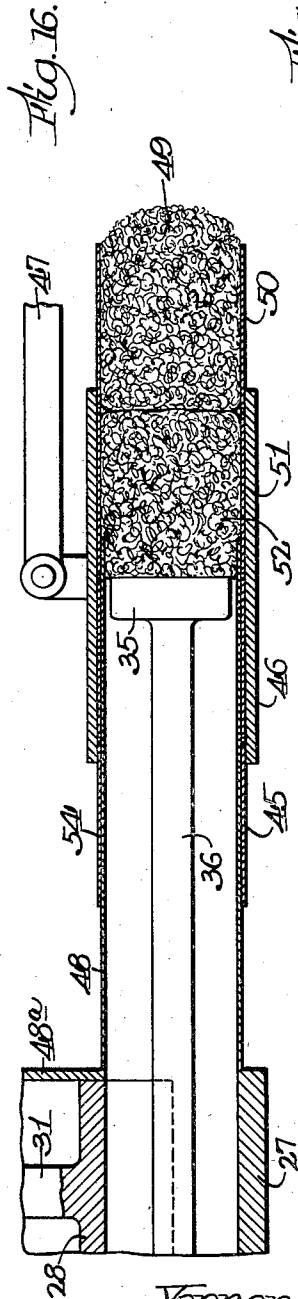
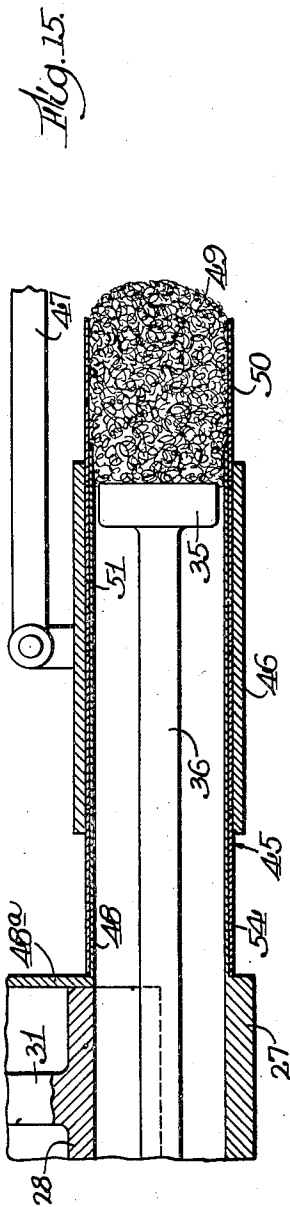
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PACKAGING OF FIBROUS MATERIALS

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5 Sheets-Sheet 4



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PACKAGING OF FIBROUS MATERIALS

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Fig. 18.

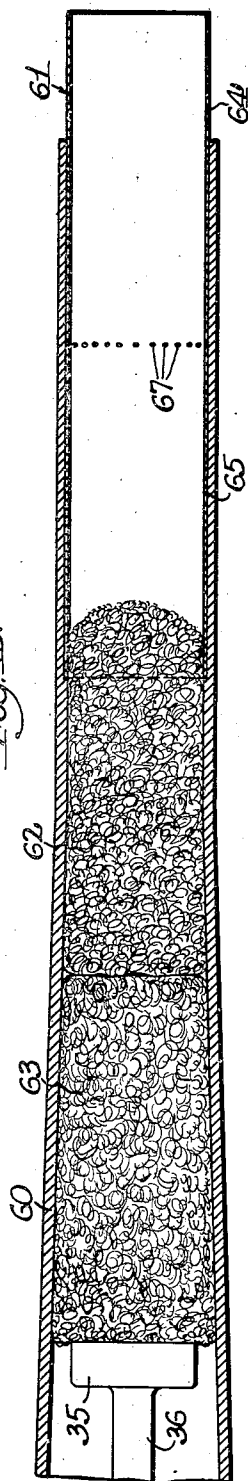


Fig. 19.

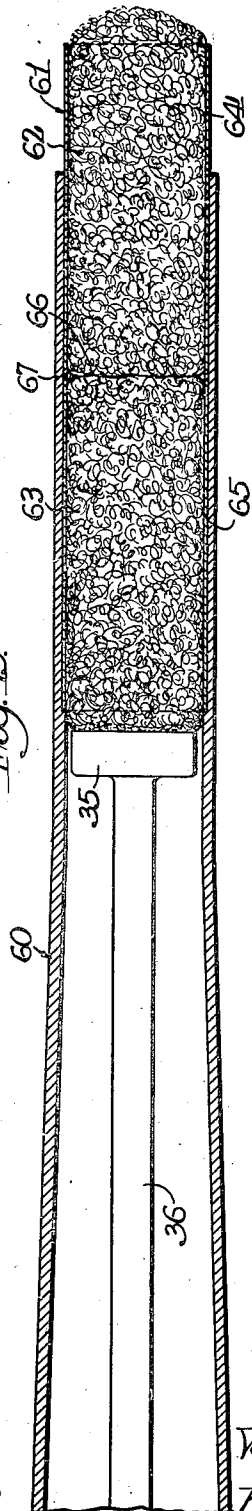
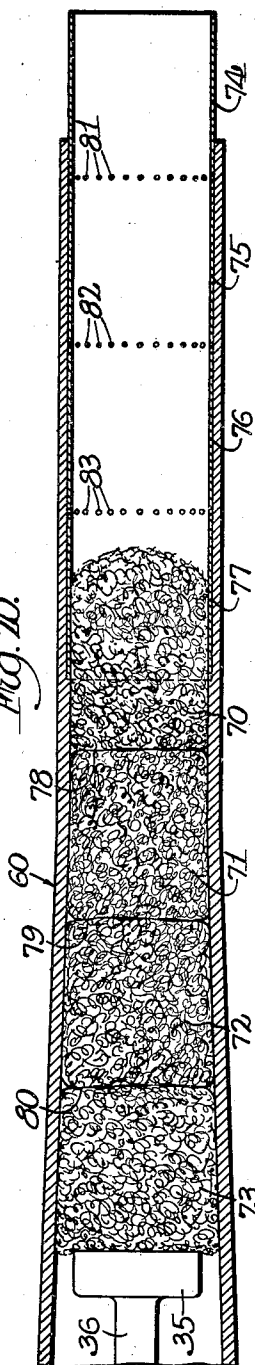


Fig. 20.



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UNITED STATES PATENT OFFICE

2,057,121

PACKAGING OF FIBROUS MATERIALS

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Application September 8, 1933, Serial No. 688,582

4 Claims. (Cl. 226—100)

The present invention relates to the packaging or packing of fibrous materials, such as metal wool, and more particularly steel wool and the like, in containers or holders or wrappers.

Among the objects of the invention is to provide a novel method of packaging or packing fibrous material, such as metal wool often times designated "steel wool" although being of any desired metal or even of other material having the characteristics of metal wool, by the placing or arranging of predetermined unit masses of the material in compressed condition in a container, holder or wrapper which is segmentally separable or severable at a given locus, in such a way that the unit masses will have a definite line of cleavage between them and opposite the locus of severance of the wrapper, whereby upon severance of the wrapper at the locus of severance, the unit masses of fibrous material will readily separate at the line of cleavage, and each of said masses will remain in compressed condition in its respective segment free and independent from the mass previously adjacent to it, each unit mass imposing on its respective segment a tension sufficient for said wrapper segment to maintain the unit mass in compressed condition and as a part of said segment.

One distinct and important advantage of the present package is that the entire mass of the material or steel wool need not be exposed to the atmosphere so as to become dusty or wet, but may be retained compressed in a smaller mass than were the entire package opened.

Other objects, advantages, capabilities, features and process steps are comprehended by the invention as will later appear, and as are inherently possessed by the invention.

A divisional application has been filed to cover the package.

Referring to the drawings:

Fig. 1 is a perspective view of the package, the container or holder of which consists of two segments, each containing a separate given mass of steel wool;

Fig. 2 is a similar view showing the container or holder having four segments, each containing separate masses of steel wool;

Fig. 3 is a longitudinal section taken through the package shown in Fig. 1;

Fig. 4 is a longitudinal sectional view taken through the package shown in Fig. 2;

Fig. 5 is a perspective view of an alternate construction of package;

Fig. 6 is a longitudinal sectional view taken through the package shown in Fig. 5;

Fig. 7 is a view in section of a device for effecting the packaging, this view showing one stage of operation;

Fig. 8 is a similar view to Fig. 7 but showing another stage of operation;

Fig. 9 is another view similar to Figs. 7 and 8, and showing a still further stage of operation;

Fig. 10 is a transverse sectional view of the means shown in Figs. 7, 8 and 9 at a preliminary stage of operation;

Fig. 11 is a transverse sectional view taken in a plane represented by line II—II in Fig. 7 of the drawings;

Figs. 12, 13 and 14 are sectional views of another means designed to effect packaging and showing different stages of the process of packaging;

Figs. 15, 16 and 17 are sectional views of a further means showing the different stages of operation for effecting packaging; and

Figs. 18, 19 and 20 are sectional views of a still further means showing different stages of operation for effecting packaging.

Referring now more in detail to the drawings, and first to Figs. 1, 2, 3 and 4, the package produced by the novel means and process of the present invention, is shown in the form of a cylinder, although it is to be understood that other forms or shapes may be used. The package comprises a container 1 having a plurality of segments. In Figs. 1 and 3, the package, container, wrapper or holder is shown as having two segments 2 and 3. Midway of the length of the container, the latter is provided with any suitable means such as perforations 4, rouletttings, scorings or other suitable similar means whereby the container may be severed or separated along the series or lines of the perforations, rouletttings or scorings. Similarly the package shown in Figs. 2 and 4 comprises four segments 5, 6, 7 and 8, the segments being separated by lines of rouletting, perforations, scoring or the like, 9, 10 and 11 as shown. It is to be understood that the particular number of the segments shown do not in any way limit the invention thereto, but any number of segments may be used as desired.

The perforations, rouletttings, scorings and the like constitute severance or weakening traces at which the segments may separate or part at the times when it is desired to sever or separate a segment from another of the package. The expression "weakening trace" is to be taken as generically comprehending perforations, indentations, rouletttings, scoring, cuts, channels, grooves, and the like, which so condition, as by weakening,

the package at given loci, as to determine the places where the segments will part or separate.

In each of the segments is shown a body of fibrous material such as the bodies 12 and 13 as shown in Fig. 3, and the bodies 14, 15, 16, and 17, as shown in Fig. 4. It will be noted that each body or unit of fibrous material occupies only its respective segment, and there is a definite parting surface 18 between the bodies 12 and 13, and 19, 20 and 21 between the bodies 14, 15, 16, and 17 as clearly shown in Figs. 3 and 4. It will be also noted that these parting surfaces are opposite the lines of perforations 4, 9, 10 and 11, so that when the segments are severed or separated the quantities or masses of the fibrous material in the segments will also part in the same locus or loci of parting for the holder or container segments. Each body of fibrous material may be of the same grade, or as shown in Fig. 4, these bodies may be of varying grades, or degrees of fineness or coarseness, so that the user may supply his needs for different grades from a single package.

In Figs. 5 and 6 is shown an alternate form of package in which the bodies or masses 14^a, 15^a, 16^a and 17^a are placed or compacted in a container or holder 1^a having a series of spirally arranged roulettines, perforations or scorings or like weakening traces 4^a extending for the length thereof. Thus, by partially unwinding the container, one or more of the separated bodies or masses may be removed and the remainder left in the container until ready for any desired disposition thereof. As stated in connection with Figs. 1 to 4 inclusive, these bodies or masses may be of varying grades or degrees of coarseness. If desired, each body or mass may be wrapped separately before being placed in the container or holder so as to maintain the separated body or mass in a compressed state after it has been removed from the container.

Figs. 7 to 11 inclusive show a means for packaging. It comprises a box having a base plate 23, an upper plate 24, end walls 25 and 26, and side walls 27 and 28. The side walls are formed on the inner side with semi-cylindrical faces 29 and 30, and of these side walls, the side wall 28 is movable between the upper and lower plates 23 and 24, by means of a plunger or connecting rod 31, while the other side wall 27 is fixed. The upper plate 24 is connected to the side wall 27 by means of a suitable hinge 32 as shown in Fig. 10.

The end wall 26 is provided with an annular flange 33 adapted to receive an end of a container or holder 1 as clearly shown in Figs. 7, 8 and 9. The end plate 25 is provided with an opening 34 through which may pass a plunger head 35 carried by a connecting rod 36 as clearly shown in Figs. 7, 8 and 9.

In the operation of this device and with the upper plate 24 in open position, a given amount of fibrous material such as steel wool is placed in the box as shown in Fig. 10. Then by suitable mechanism, the side wall 28 is moved toward the side wall 27 until it reaches the position or relation shown in Fig. 11, thereby compressing the mass of fibrous material into a cylinder. During this operation, the plunger 35 is located in the opening 34 so as to close it as shown in Fig. 7. It will be noted that by reason of the shape of the faces 29 and 30, that when the side walls 27 and 28 are brought together as shown in Fig. 11, the space therebetween is a cylinder, and that the fibrous material is necessarily compressed into the form of a cylinder therebetween.

The size of the box is designed for compressing

a given mass or quantity of steel wool so that it will have the proper size and shape for fitting into or occupying the segment of the container to be packed or loaded. By suitable mechanism the plunger 35 is then pushed through the cylindrical space between the side walls 27 and 28 (see Fig. 11) so as to move the compressed mass shown in Fig. 7 into the first segment of the container as shown in Fig. 8. Then the plunger 35 may be withdrawn.

The container may then be disconnected from the flange 33 and its opposite end engaged therewith. Another mass of steel wool is compressed as previously described and the plunger 35 presses this compressed mass into the other segment of the tube as is clearly shown in Fig. 9 of the drawings. The tube is now completely packaged and is ready for marketing, use or other dispositions.

The great convenience and economy had and obtained by such a package becomes apparent when considering that a portion or part of the whole package may be used at any one time without necessitating breaking open the whole package, thus avoiding the exposing of the entire contents of the whole package to deteriorating influences or conditions when, as is often the case, the total contents are not required for immediate use or other disposition.

Figs. 12, 13 and 14 show a similar device to that shown in Figs. 7 to 11 inclusive, with the exception that the plunger 35 operates in a box designed to compress a charge or mass of steel wool to be packed in the sections or segments of the container having a larger number of segments, as for example four segments. As will be seen in Fig. 12, the mass of steel wool is compressed into cylindrical forms and the plunger 35 is ready to move or force the compressed cylinder of fibrous material into the tube or container having a plurality of segments.

Fig. 13 shows the plunger having pushed the charge or mass 40 into the furthest segment 41 and then the plunger returns to its original position as shown in Fig. 12 ready to act upon the next compressed mass of metal wool. In this Fig. 13 is also shown in dotted line positions the different strokes of the plunger 35. As for example, the second mass of compressed steel wool is moved to occupy the second segment 42 of the tube as shown in Figs. 13 and 14, and the third mass of material is pushed into and left in the third segment 43, and finally the plunger 35 will push the last mass of material into the fourth segment 44. After the container is filled in this way, it may be removed from the flange 33 and delivered for sale, use or other disposition. As previously pointed out, the great convenience and economy of this segmented package, is readily apparent.

In Figs. 15, 16, and 17 is shown another device for packing or packaging the different sizes, masses and/or grades of steel wool. In this case, the container 45 is carried by a sleeve 46 supported from an arm 47. The container is first placed upon an elongated tube or sleeve 48 made rigid with the end of the box 48^a which is constructed the same as the box shown in Figs. 7 to 11 inclusive. It will be noted that the container projects beyond the end of the sleeve 48 substantially the length of a segment of the container. The first compressed cylinder or mass of steel wool 49 is pushed by the plunger 35 into the segment 50 and left there. The arm 47, together with a sleeve 46 then moves the container 45 into the position shown in Fig. 16 so as to bring the segment 51

in the position where segment 50 was previously located.

The second mass of steel wool 52 is then pushed from the box into the position shown in Fig. 16, the stroke of the plunger 35 being the same in every case. This procedure is followed by again moving the sleeve 46 to the right as shown in Fig. 17 until the last charge or mass 53 of steel wool is deposited in the last segment 54 of the container. The tube may then be removed from the sleeve 46 and the end of the sleeve 47, and sent away for selling.

In Figs. 18, 19 and 20 is shown another form of device for packing or packaging fibrous materials in a tubular container, Figs. 18 and 19 showing the packaging of two charges or masses of steel wool in a two segment tube, and in Fig. 20 four charges or masses are packed in a four segment tube. In this device is provided a tapered chamber 60 in the larger end of which may be positioned a mass of steel wool of a given amount. The plunger 35 is then operated by suitable mechanism to push the mass into the smaller end of this chamber. At the discharge end of the chamber, is located the container 61 held with sufficient friction as to prevent its movement when a charge or mass of fibrous material 62 is pushed by the plunger into the tube. Preferably, two charges or masses 62 and 63 of the steel wool may be made in cylindrical form in the compressing boxes as shown in the previous figures, and pushed into the larger end of the chamber 60 and the plunger 35 push the two masses into the tube 61 so that the mass 62 will occupy the segment 64 and the mass 63 will occupy the segment 65, the final result being shown clearly in Fig. 19. The positioning of these two masses is such that the parting surface 66 therebetween will be located opposite the severing perforations 67, so that when the holder is later severed or broken, at the perforations 67, the masses will part in the same locus without interference by the material in one with the material in the other segment.

Likewise, as shown in Fig. 20, four given masses, 70, 71, 72 and 73 which may be previously formed in a more or less cylindrical form in a compressing box as shown in the other figures, and pushed by a plunger 35 so as to force this train of masses into the segments 74, 75, 76, and 77, respectively, with the parting surfaces 78, 79 and 80 respectively opposite the severing perforations or rouletting 81, 82 and 83 of the container or holder, so that when the segment is later severed or broken thereat, the parting surfaces will be at the same loci. After loading the holder, the holder may be removed from the reduced end of the chamber or sleeve 60 and sent away for selling.

Although the various forms of packing devices are shown in the process of packaging a container which is rouletted or perforated so as to be separated into a plurality of segments as shown in Figs. 1 to 4 inclusive, it is to be understood that such devices or mechanisms are equally well adapted for packing or packaging steel wool in a container of the type shown in Figs. 5 and 6.

While I have herein disclosed an illustrative process of carrying out my invention and the new

embodiments of means for carrying out the process and a few forms of the article produced thereby, it is to be understood that the invention is not limited thereto, but comprehends other constructions, arrangements of parts, details, features and process steps, without departing from the spirit of the invention.

Having thus disclosed the invention,

I claim:

1. A process of packaging fibrous material having substantially the characteristics of metal wool in an inclosing wrapper having means for providing for severance of the wrapper at a predetermined locus, comprising the placing and arranging of predetermined units of compressed fibrous material in said wrapper with a line of cleavage between said units and opposite said locus of severance of said wrapper, and imposing a tension on said wrapper sufficient for said wrapper to maintain said units in compressed condition in said wrapper and as a part of the severed wrapper portion when said wrapper is severed at the locus of severance.

2. A process of packaging fibrous material having substantially the characteristics of metal wool in an inclosing wrapper having means for providing for severance of the wrapper at a predetermined locus, comprising the compressing of predetermined masses of the fibrous material into independent units of given form and compression, then placing and arranging said compressed units in said wrapper in predetermined portions of the wrapper with a definite line of cleavage between said units and opposite said locus of severance of said wrapper for each of said units to remain a compressed part of the severed portion of the wrapper when severed at said locus of severance.

3. A process of packaging fibrous material having substantially the characteristics of metal wool in an inclosing wrapper having means for providing for severance of the wrapper at a predetermined locus, comprising the compressing of predetermined masses of the fibrous material into independent units of given form and compression, then placing and arranging said compressed units in said wrapper in predetermined portions of the wrapper with a definite line of cleavage between said units and opposite said locus of severance of said wrapper, and maintaining said units under compression in said wrapper to impose a tension on said wrapper sufficient for each of said units to remain a part of the severed portion of the wrapper when severed at said locus of severance.

4. A process of packaging fibrous material in a segmental elongated open ended holder having a locus of severance, comprising compressing masses of said material into predetermined units of given shape to fit into said segments and to have a line of cleavage therebetween and opposite said locus of severance, and forcing each of said compressed masses to occupy a segment of the holder with a line of cleavage between said units and opposite said locus of severance and to remain compressed in said segments when the segments of the holder are separated.

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