May 4, 1937. J. R. PRICE 2,079,467

PROCESS FOR PRODUCING METALLIC PACKING

Original Filed March 12, 1932 2 Sheets-Sheet 1

Fig. 1.

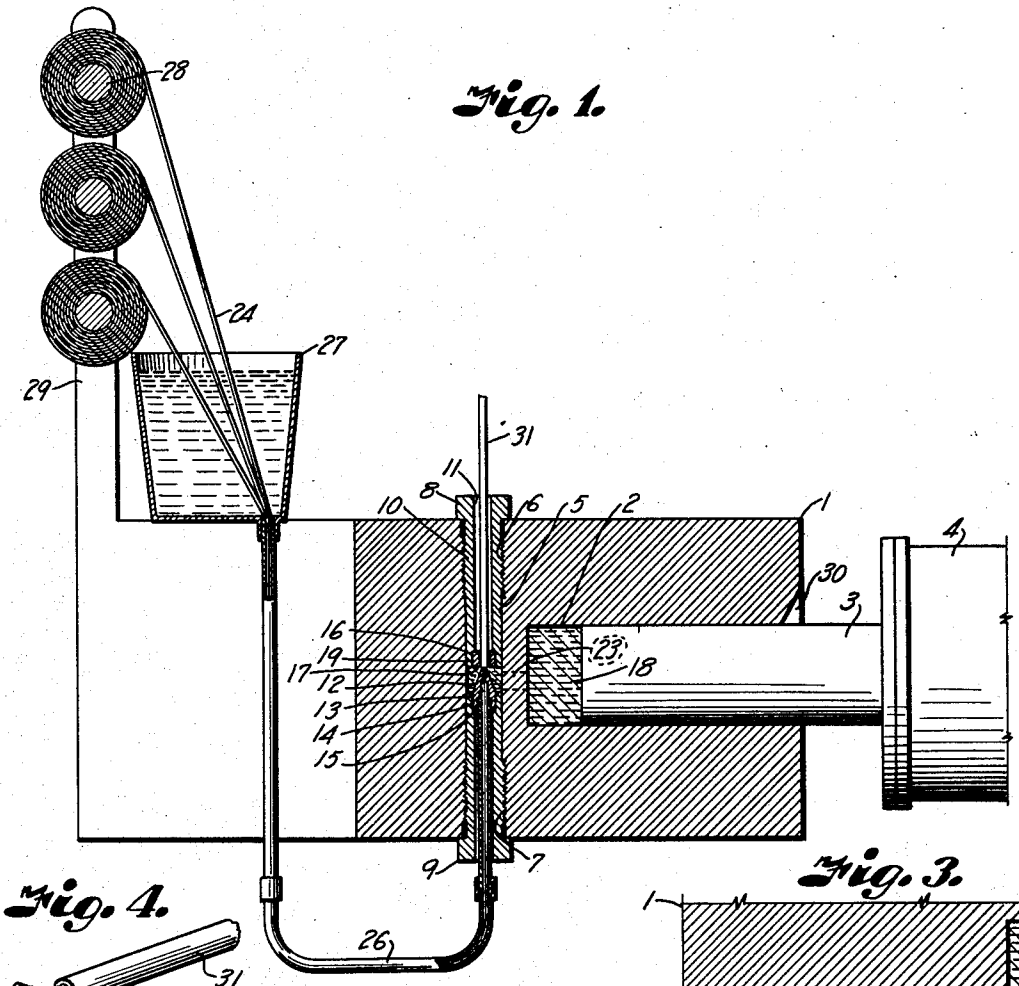


Fig. 4.

Fig. 2.

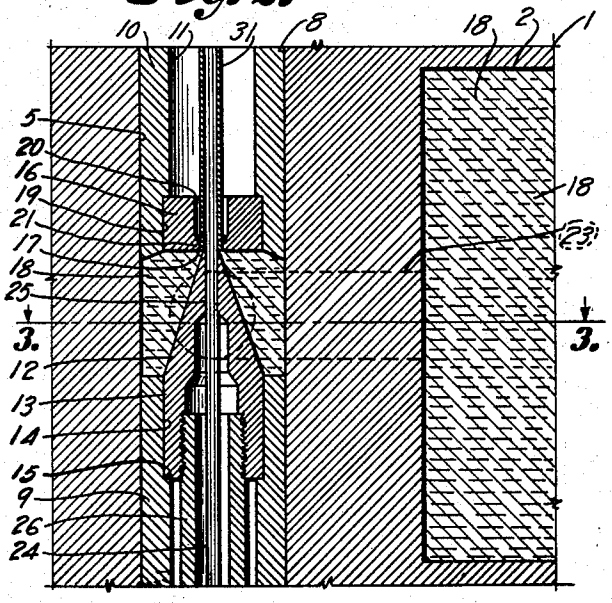
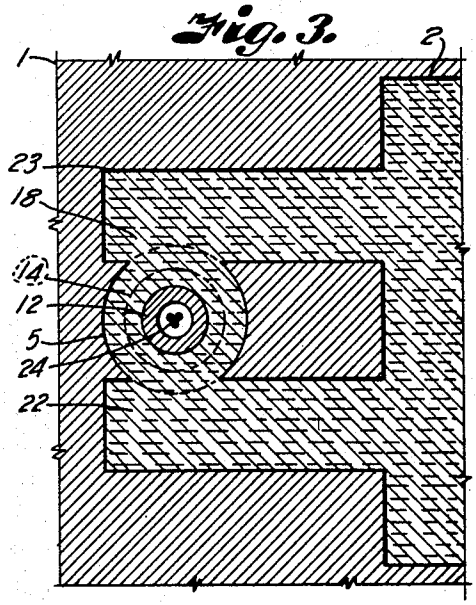


Fig. 3.



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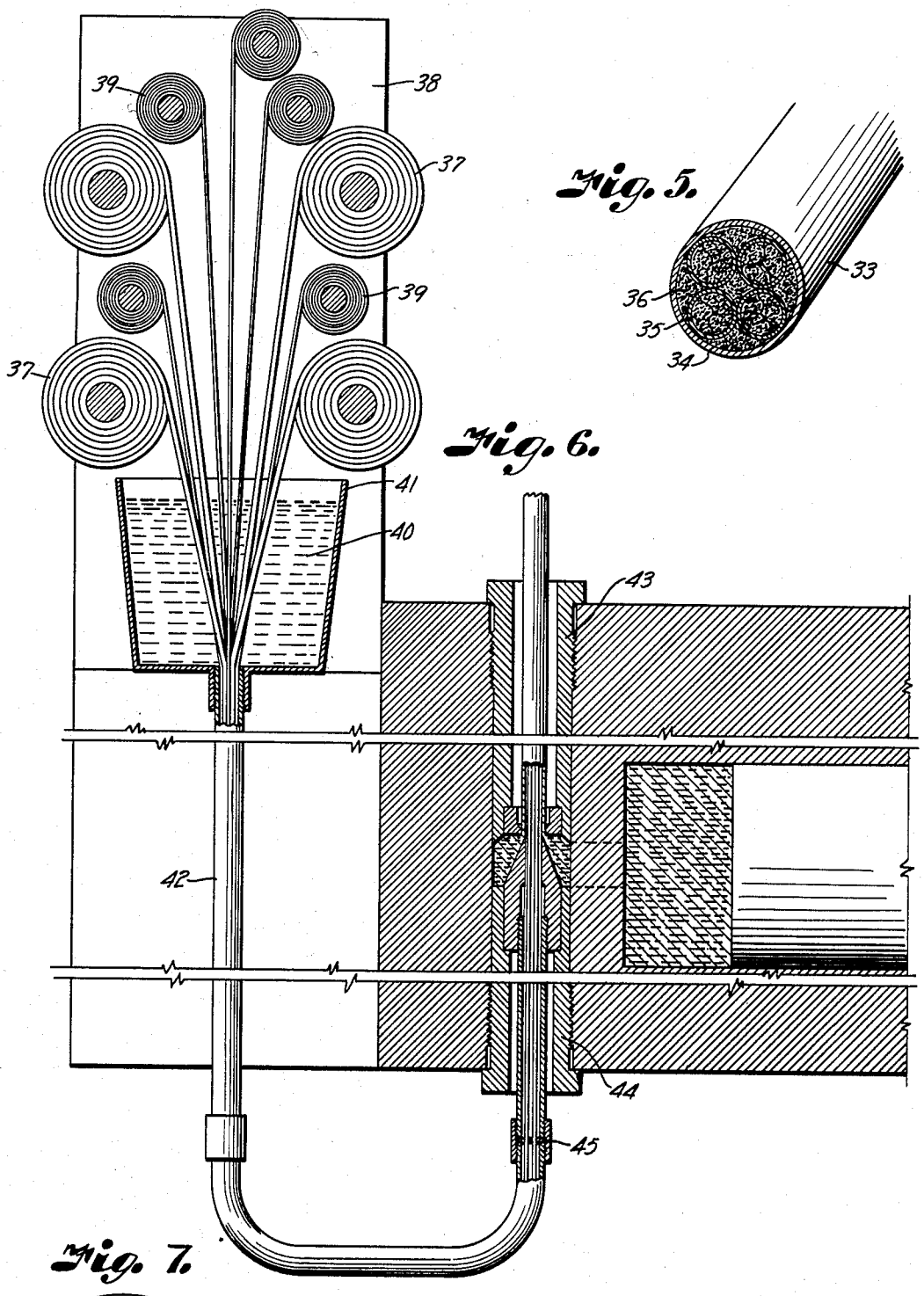
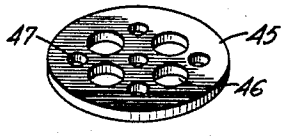


Fig. 6.

Fig. 5.

Fig. 7.



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2,079,467

PROCESS FOR PRODUCING METALLIC PACKING

Jacob R. Price, Kansas City, Mo., assignor to Price Metal Refining Company, Kansas City, Mo., a corporation of Missouri

Original application March 12, 1932, Serial No. 598,385. Divided and this application November 23, 1933, Serial No. 699,474

4 Claims. (Cl. 154—2)

This invention relates to a process for producing metallic packing and is a division of my application for patent on "Method of and apparatus for producing metal packing", Serial No. 598,385, filed March 12, 1932 and which has matured into Patent No. 1,956,834, dated May 1, 1934.

The objects of the present invention are to provide a continuous process whereby the packing is easily and economically manufactured, and to provide an improved metallic packing wherein an impregnated core is simultaneously covered incidental to the formation of the metal sheathing, so that the sheathing may comprise a continuous tube free from seams through which the impregnating material might escape.

In accomplishing these and other objects of the invention, I employ in my process an apparatus as illustrated in the accompanying drawings, wherein:

Fig. 1 is a diagrammatic sectional view of the apparatus with which I carry out my process of manufacturing a metallic packing.

Fig. 2 is an enlarged vertical sectional view through the pressure cylinder and the dies through which the metal is being extruded to ensheath a compressible core.

Fig. 3 is a horizontal sectional view through the die and adjacent parts of the pressure cylinder on the line 3—3, Fig. 2.

Fig. 4 is a detail perspective view of a portion of one form of packing produced in accordance with my process.

Fig. 5 is a similar view of a different form of packing wherein the core includes a plurality of strands of packing, as illustrated in Fig. 4, interlaid with a plurality of flax strands to fill the interstices therebetween.

Fig. 6 is a diagrammatic view of the setup for producing the packing illustrated in Fig. 5.

Fig. 7 is a perspective view of a guide plate for guiding the metal covered strands and the flax in their proper relation.

Referring more in detail to the drawings:—

1 designates a body casting having a cylindrical chamber 2 opening from an end thereof to slidably mount a ram 3 that is operable by a hydraulic press indicated by the housing 4.

Extending vertically through the body casting and spaced from the end of the chamber 2 is a bore 5 having internal threads at its upper and lower ends 6 and 7 to accommodate die carrying nipples 8 and 9, respectively. The nipples constitute tubular sleeves 10 having threaded peripheral portions to engage the threads of the bore, whereby they may be adjustably spaced to and from each other to position and space the die members later described. The nipples are provided with aligning concentric bores 11 through which a compressible strand and the completed packing are delivered respectively to and from the die members now described.

The lower or core die member 12 includes a cylindrical base portion 13 mounted in a corresponding recess 14 in the end of the member 9, the recess 14 being preferably larger in diameter than the bore 11 to provide an annular shoulder 15 against which the lower end of the die may seat, as best illustrated in Fig. 2. The upper end of the die member is substantially cone-shaped to guide the metal in forming the inner diameter of the packing, and terminates short of the upper die member 16 to provide an annular passageway 17 therebetween for the extrusion of the formative metal 18 delivered under pressure to the bore 5 at a point between the ends of the die carrying nipples.

The upper die 16 is substantially cylindrical in shape and seats in a recess 19 formed in the end of the upper member 8, and is provided with a central cylindrical passageway 20 of larger diameter than the packing being formed, the lower end of which terminates in a contracted throat 21 of a diameter equal to the outer diameter of the packing.

Formed in the body casting and communicating with the bore 5 at opposite diametrical points thereof, and with the chamber 2, are spaced channels 22 and 23 for delivering metal from the chamber 2 to the bore 5 and between the dies, so that the pressures acting on the two streams of metal are opposed and equal to effect equal pressure of the metal at all points around the dies.

In order to deliver a plurality of strands 24 through the dies, the lower die member is provided with a passageway 25 extending through the apex of the cone and having internal threads at its lower end to accommodate a conduit 26 communicating with a receptacle 27 containing a lubricant through which the strands are drawn. The strands are preferably wound upon spools 28 carried on suitable framework 29 above the body casting 1.

In operating the apparatus, the strands are drawn from the spools and extended through the opening in the bottom of the receptacle 27, through the conduit 26, and through the passageways in the dies. The ram 3 is then re-

tracted and the chamber 2 is filled with molten formative metal through a notch 30. The metal flows from the chamber, filling the channels 22 and 23 and the portion of the bore 5 between the dies.

The metal is then allowed to cool and pressure is applied thereto by the hydraulic press through the ram 3 to extrude the metal between the dies, to form a continuous metal sheathing 31 about the compressible strands. As the metal is extruded, the strands are simultaneously drawn through the lubricant material and through the dies to effect a continuous process. The thickness of the walls of the sheathing may be varied by threading the die carrying nipples to and from each other to vary the amount of metal extruded through the upper die, so that packing of various grades may be provided.

The packing illustrated in Fig. 5 includes an outer metallic sheathing 33 enclosing a core 34 including a plurality of strands 35 of packing produced as previously described, and interlaid with strands of flax 36 to fill the interstices therebetween. This packing is produced by a process similar to that illustrated in Fig. 1 wherein the strands of metal packing 35 are wound on spools 37 supported by a rack 38 also supporting spools 39 carrying the flax strands 36.

From the spools 37 and 39 the packing and flax strands are drawn through a body of lubricant 40 contained in the receptacle 41, and through a conduit 42 to the dies 43 and 44, which are identical to the dies previously described except for their larger size. The strands are guided in proper relation through the die by a plate 45 having apertures 46 for the metal strands and apertures 47 for the flax strands located to give the proper arrangement of the strands as they pass through the dies and whereby the metallic strands are uniformly spaced between selected compressible strands to form a cellular arrangement. The plate 45 is preferably located adjacent the end of the conduit at a point directly below the dies as shown.

Upon actuation of the ram 3, the metal is extruded about the composite core in exactly the same manner as when the single strands are sheathed, as illustrated in Fig. 1.

The impregnating material for the strands 24 may be any suitable lubricating oil, or a mixture of oil and graphite, depending upon the nature and use of the packing.

The formative metal from which the sheathing is formed may also consist of various soft metals or alloys as desired.

From the foregoing it is apparent that I have provided a process which produces a solid, continuous sheathing for the compressible core which will retain the impregnating material until the packing is ready for use.

What I claim and desire to secure by Letters Patent is:

1. The process of producing a packing of the character described including confining a body of formative metal, impregnating a compressible strand by passing the strand through a body of lubricant, guiding the strand through the body of metal, extruding the metal in a continuous tubular sheath about the strand to form a metallic strand, passing said metallic strand together with a plurality of fibrous strands through a second body of metal, and extruding the metal around the strands to form a sheath about said metallic strand and said fibrous strands.

2. The process of producing a packing of the character described including confining a body of formative metal, impregnating a compressible fibrous strand by passing the strand through a body of lubricant, guiding the strand through the body of metal, extruding the metal in a continuous tubular sheath about the strand to form a metallic strand, coating said metallic strand and impregnating a plurality of fibrous strands by passing said strands through a body of lubricant, guiding said metallic and fibrous strands through a second body of metal, and extruding the second body of metal about said impregnated strands to form an outer metallic sheath.

3. The process of producing a packing including confining a body of formative metal, impregnating a compressible strand with lubricant, and passing the impregnated strand together with a metallic strand through the body of metal, and extruding the metal in a continuous tubular sheath about the compressible and metallic strands to form a cellular packing structure.

4. The process of producing a packing including confining a body of formative metal, impregnating a plurality of compressible strands with a lubricant, guiding the impregnated strands together with metallic strands through the confined body of formative metal, separating the compressible strands by the metallic strands, and extruding the formative metal in a continuous tubular sheath about the strands to form a cellular packing structure.

JACOB R. PRICE.