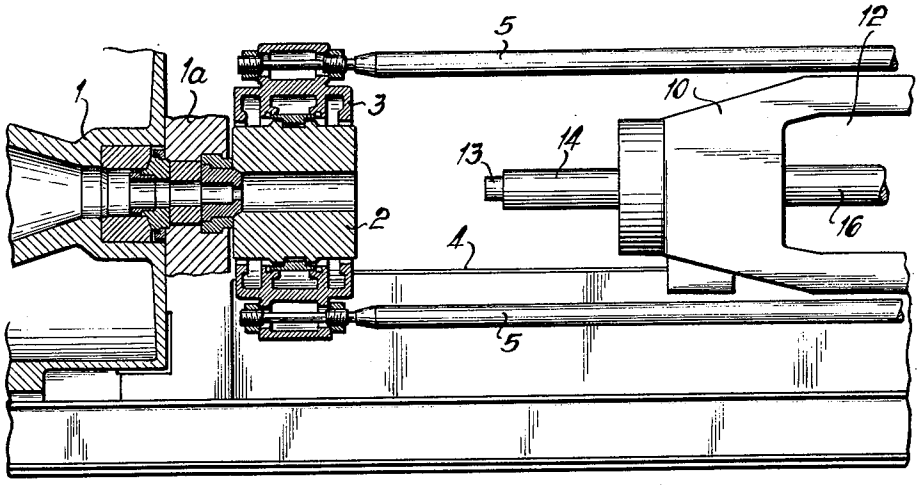
March 3, 1964 FRANZ-JOSEF ZILGES ETAL 3,123,215

TUBE-EXTRUSION PRESSES

Filed Jan. 9, 1961 3 Sheets-Sheet 1

FIG. 1a



March 3, 1964 FRANZ-JOSEF ZILGES ETAL 3,123,215

TUBE-EXTRUSION PRESSES

Filed Jan. 9, 1961 3 Sheets-Sheet 2

FIG. 1b

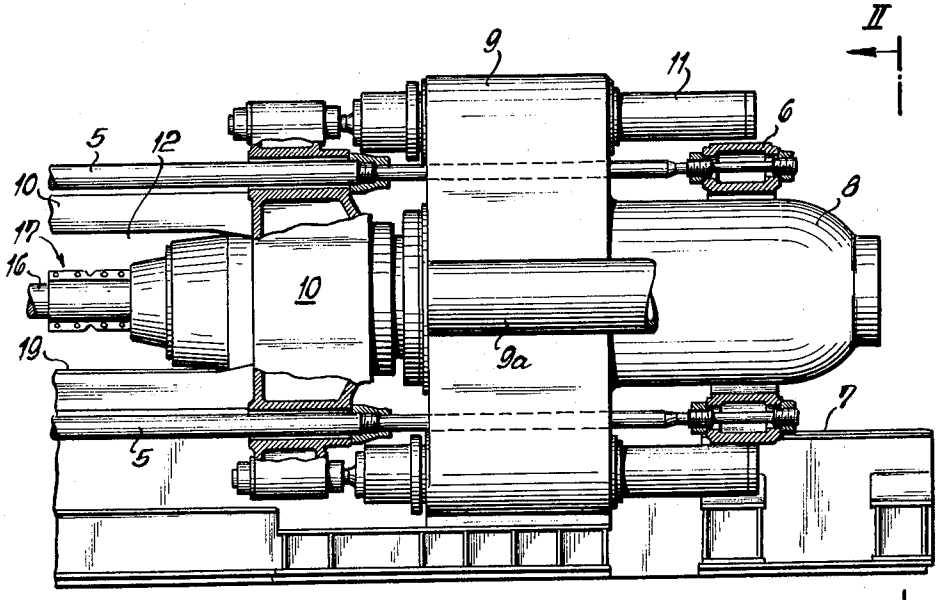
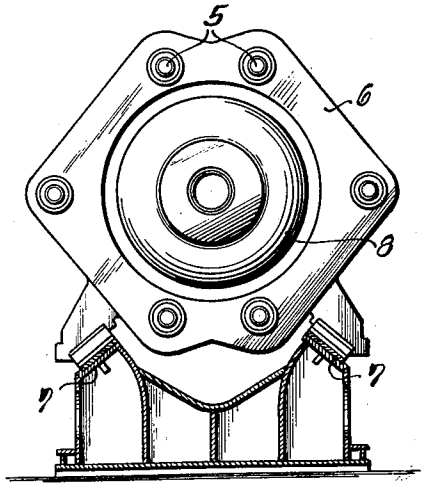


FIG. 2



March 3, 1964 FRANZ-JOSEF ZILGES ETAL 3,123,215

TUBE-EXTRUSION PRESSES

Filed Jan. 9, 1961 3 Sheets-Sheet 3

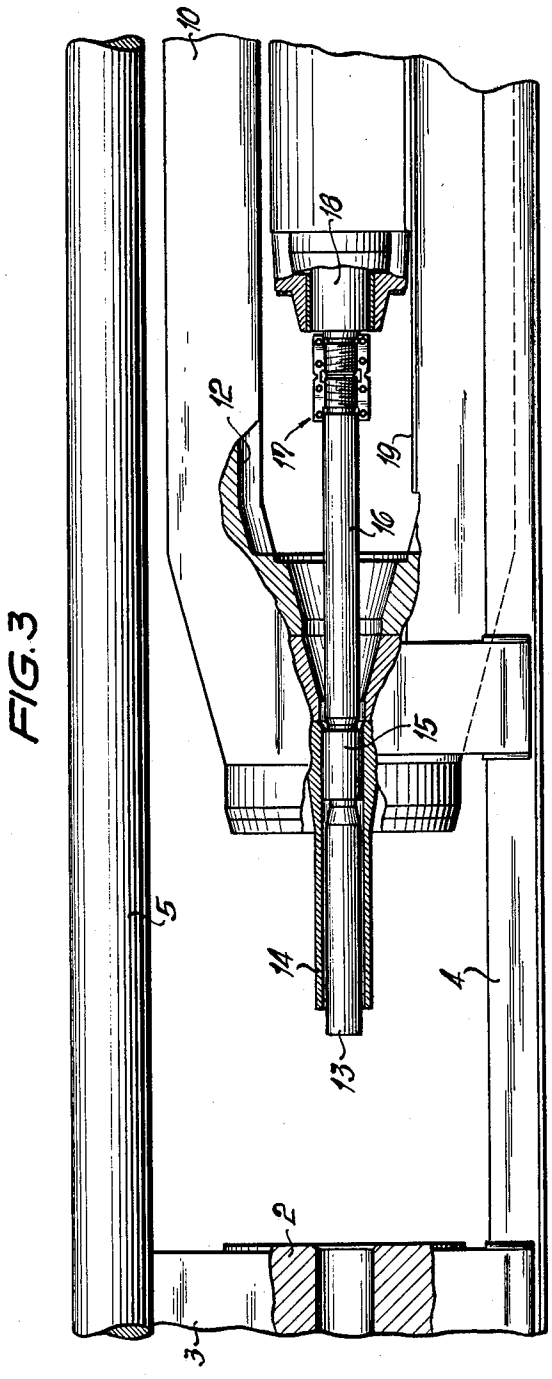


FIG. 3

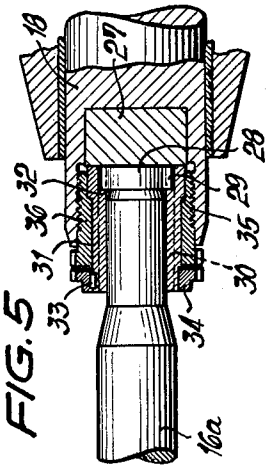


FIG. 5

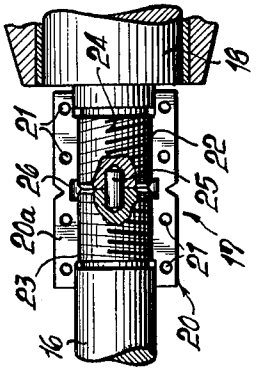


FIG. 4

United States Patent Office 3,123,215 Patented Mar. 3, 1964

3,123,215

TUBE-EXTRUSION PRESSES

Franz-Josef Zilges, Rheydt, Germany, and Gerhard Paul Krause, Pittsburgh, Pa., assignors to Schloemann Aktiengesellschaft, Düsseldorf, Germany

Filed Jan. 9, 1961, Ser. No. 81,527
Claims priority, application Germany Feb. 22, 1960
1 Claim. (Cl. 207—19)

This invention relates to an extrusion press with a mandrel and its accessory implements slidable in the platen of the press ram, and particularly to a tube-extrusion press. Such tube presses have the advantage of a platen so guided that the dimensions are extremely well maintained, since the platen is made very long with respect to the mandrel and its driving members to be accommodated therein. The total length of the press thus remains within moderate limits, because the mandrel implements are arranged in the platen and not located behind the extrusion cylinder. Since however the possibility of taking the mandrel implements out of the platen in a forward or rearward direction is provided, comparatively narrow limits are set for the shortening of the over-all length of the press, so that the saving in over-all length is in part lost again.

The object of this invention is to reduce the over-all length of the press as far as possible, and nevertheless to enable the tools to be easily dismantled. With this end in view the invention consists in the mandrel implements consisting of three parts releasable from one another, namely the mandrel, the mandrel-holder, and a mandrel-holder-carrier sliding in the platen; that the connection between the mandrel-holder and the mandrel-holder-carrier is accessible through a window aperture in the platen and is releasable by rotary motions with the implements stationary, that is, not rotated; and that the mandrel-holder is withdrawable through the window aperture.

By the said division of the mandrel implements into three parts, and the aforementioned construction of the connecting means for the mandrel implements, the result can be obtained that the mandrel is removable from the ram either in a forward direction, or, after removal of the mandrel-holder through the window aperture in the platen, likewise through this window aperture.

The invention further relates to the special construction of the connecting means, which, on the lines mentioned above, are easily releasable, with a saving of space.

The invention is illustrated by way of example in the accompanying drawings, in which:

FIGURE 1*a* shows the arrangement, as a whole, of part of a press according to the invention, in side elevation, partly in section;

FIGURE 1*b* shows another part of the press, also in side elevation and partly in section;

FIGURE 2 is a rear view, partly in section on the line II—II in FIGURE 1;

FIGURE 3 is a side view of part of the press shown in FIGURE 1*a*, on a larger scale, and partly in section;

FIGURE 4 shows one form of connecting means in longitudinal section; and

FIGURE 5 shows another form of connecting means, likewise in longitudinal section.

The press comprises a bolster 1 and a die-holder 1*a*. Against the latter is impelled a container 2, with a container-holder 3. The container-holder 3 runs with claws upon a guideway 4, and is rigidly connected by means of rods 5 with a ring-traverse 6, which in its turn runs on guideways 7, and is connected, by way of rods not shown, with pistons, which slide in lateral cylinders 9*a*. The main extrusion cylinder 8 is carried by a cylinder

cross-bar 9, and actuates an elongated platen 10, which is likewise slidable on the guideways 4. The platen 10 is withdrawable with the aid of retracting pistons which run in cylinders 11. It has window apertures 12 on both sides, through which the mandrel implements are accessible. The mandrel 13 is longitudinally slidable in the press ram 14, which is fixedly mounted on the platen 10.

The mandrel 13 is connected with the mandrel-holder 16 by way of a connecting means, namely a bayonet joint 15. This mandrel-holder is in its turn connected with the mandrel-holder-carrier 18 by way of another connecting means 17. The mandrel-holder-carrier is supported in a mandrel cross-bar which runs upon guide rails 19, which are arranged in the platen 10. The connecting means 17 that connects the mandrel-holder 16 with the mandrel-holder-carrier 18 is so arranged in relation to the window aperture 12 that it is accessible through this aperture. The connecting means 15 is accessible from the end face of the ram 14 when the mandrel 13 is moved outwards. The connecting means 15 and 17 are here so constructed that they can be released by rotary movements, while the tools 13, 16 and 18 are secured against rotation. The mandrel 13 can be slid forward out of the ram 14, or, after the mandrel-holder 16 has been dismantled, can be taken out through the window aperture 12. The mandrel-holder 16 is taken out of the aperture 12 after the release of the connecting means 15 and 17.

The connecting means 17 is illustrated on a larger scale in FIGURE 4. It comprises two half-shells or half-sleeves, one of which, namely 20, is visible in FIGURE 4. This half-shell has two flanges 20*a*, with bores 21 for the passage of screws, which hold the half-shells together. The right-hand ends of the half-shells have a right-handed screw thread 22, while the left-hand ends have a left-handed thread 23. The right-hand end of the mandrel-holder 16 has a thread that corresponds to the thread 23, while a spigot 24 of the mandrel-holder-carrier 18 is provided with a thread that corresponds to the thread 22. The spigot 24 and the end of the mandrel-holder 16 are kept co-axial with one another by means of a centering spigot 25. The half-shells 20 have in the middle a weakening 26, which serves as a pre-set breaking point. In the event therefore of the mandrel appliance being subjected to an excessive stress, the shells break in the region of the weakening 26, so that the actual piercing tools 13, 16 and 18 remain unharmed.

For the release of the connecting means 17, the screws passing through the screw holes 21 are released. The half-shells 20 can then be taken apart. For the re-establishment of the connection they are remounted, and the screw bolts are passed through the holes 21 and tightened up. If the half-shells 20 are now rotated about their longitudinal axis with a suitable implement, they press the end faces of the spigot 24 and the mandrel-holder 16 against one another, so that a firm connection is established.

Instead of the connecting means shown in FIGURE 4, a bayonet joint as in FIGURE 5 may be selected. Here the mandrel-holder-carrier 18 carries a pressure plate 27, against which the mandrel-holder 16*a* bears with its collar 28. In the periphery of the collar 28 are machined four or six bayonet teeth 29, which are slidable through corresponding longitudinal slots 30 in a sleeve 31. After the mandrel-holder 16*a* has been slipped in, and the sleeve 31 has been turned, the surfaces 32 of the teeth 29 bear against corresponding end faces of the sleeve 31. The sleeve 31 is connected rotationally fast by a key 33 with an actuating ring 34, on which a spanner or the like can be set. The bayonet-joint sleeve 31 has an an-

nular abutment 35, upon which presses a screw-threaded muff 36, which is screwed into the mandrel-holder-carrier 18. When the threaded muff 36 is tightened, the bayonet joint cannot be released. After the threaded muff 36 is loosened, however, the bayonet-joint sleeve can be turned through 45° or 30°, according to whether it has four teeth or six, and the teeth 29 then slip through the slots 30, when the mandrel-holder 16*a* is drawn towards the left out of the mandrel-holder-carrier 18.

What we claim is:

A tube extrusion press comprising a press ram, a platen fixed on said ram, a mandrel slidable in said platen, a mandrel holder slidable in said platen, a mandrel holder carrier slidable in said platen, means releasably connecting said mandrel and said mandrel holder, an axial recess in said mandrel holder carrier, said recess having an internally threaded side wall and an end wall, a muff threadedly received in said recess, a sleeve rotatably received in said muff, cooperating shoulders on said muff and sleeve to prevent relative axial movement of said sleeve in said muff outwardly of said recess, an internal annular recess in the inner end of said sleeve providing an abutment, a plurality of circumferentially spaced internal longitudinal grooves in said sleeve communicating with said annular recess, a collar on said mandrel holder, circumferentially spaced radially projecting teeth on said collar, said teeth being slidable through said grooves to dispose said collar in said annular recess, rotation of said sleeve with respect to said collar serving to engage said teeth with said abutment to provide a bayonet joint between said mandrel holder and said mandrel holder carrier, rotation of said muff serving to clamp said collar in engagement with the end wall of said first-mentioned recess thereby providing releasable means connecting said mandrel holder and said mandrel holder carrier, and said platen having a window aperture therein to facilitate manipulation of the means connecting said mandrel and said mandrel holder and the means connecting said mandrel holder and said mandrel holder carrier, the length of said window aperture being substantially equal to the length of said mandrel holder plus the length of the means connecting said mandrel holder and said mandrel holder carrier and said window aperture being so located as to permit insertion and removal of said mandrel and said mandrel holder when separated.

References Cited in the file of this patent

UNITED STATES PATENTS

528,167	Jones	Oct. 30, 1894
1,019,657	Kerr	Mar. 5, 1912
1,131,399	McGinby	Mar. 9, 1915
1,134,179	Boyd	Apr. 6, 1915
1,286,726	Noble	Dec. 3, 1918
1,392,363	Shannon	Oct. 4, 1921
2,085,074	Boyles	June 29, 1937
2,472,586	Harvey	June 7, 1949
2,696,397	Booth	Dec. 7, 1954
2,698,683	Martin	Jan. 4, 1955
2,732,066	Albers	Jan. 24, 1956
2,859,870	Hitz	Nov. 11, 1958
2,903,130	Reichl	Sept. 8, 1959

FOREIGN PATENTS

1,048,855	Germany	Jan. 22, 1959