

July 21, 1936.

P. C. CHRISTIANSEN

2,048,598

PRESSING TOOL FOR THE IMPRESSION OF METALS OR THE LIKE MATERIAL

Filed Feb. 25, 1929

Fig. 1.

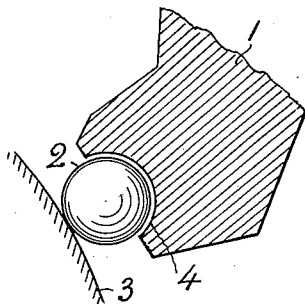


Fig. 2.

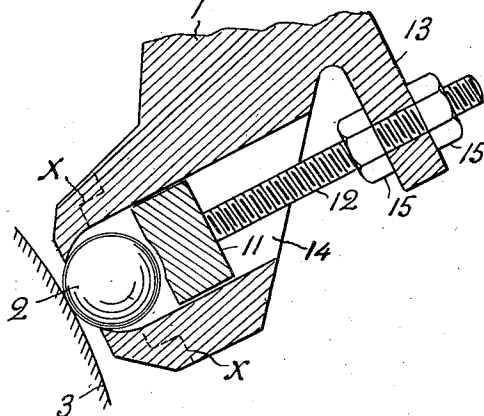


Fig. 3.

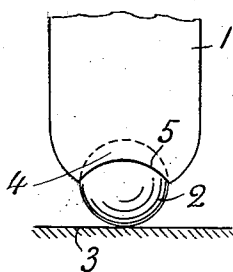


Fig. 4.

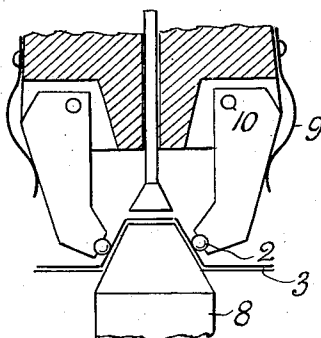
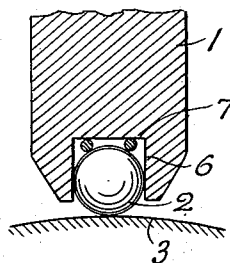


Fig.5.

P. C. Christiansen
INVENTOR

By: Marks & Clerk
Attys.

UNITED STATES PATENT OFFICE

2,048,598

PRESSING TOOL FOR THE IMPRESSION OF
METALS OR THE LIKE MATERIALPaul Christen Christiansen, Copenhagen,
DenmarkApplication February 25, 1929, Serial No. 342,624
In Denmark March 1, 1928

1 Claim. (Cl. 113—52)

This invention relates to a tool for the impression of metals or the like material. The hitherto known steels employed for this purpose were only steels provided with a more or less rounded end, with which they pressed against the blank. During the operation they had to be very abundantly lubricated, and yet it was impossible to prevent the pressing steel from seizing the blank in many cases when the speed of operation was tolerably great and the pressure was high. It has been proposed to do away with this drawback by providing the pressing tool with a roller with which it rolled over the blank. Only in the case of cylindrical articles and by constant clamping such rollers could, however, be so adjusted that they need not rub against the material or be loaded with lateral pressures rising from the friction with the material. This is especially the case with pressing tools of the kind where both the blank and the counter pressure member are stationary, while two or more pressing tools rotatably mounted around a common axis with equidistant angular intervals are pressed against the counter pressure member and axially displaced at the same time. The abovementioned deficiencies are avoided by the present invention which relates to a pressing tool having a ball rotatable in all directions and transferring the operative pressure to the blank. The drawing shows what is necessary for the understanding of the invention, Figs. 1 and 2 representing two different constructional forms of pressing steels according to the present invention partly in section, Fig. 3 is an elevation of a third constructional form, Fig. 4 is a partly sectional elevation of a fourth constructional form, and Fig. 5 is a diagrammatic section through pressing tools inserted into the machine and executing a piece of work. The shown constructional forms are only given by way of example, and the figures are quite diagrammatic. In Fig. 1, 1 is the outermost part of the shaft of the pressing tool, 2 is a ball by which the pressure is transferred to the blank 3. The ball 2 is simply mounted in a recess, e. g. a spherical cup 4, made in the end of the shaft 1. In Fig. 2, which shows another constructional form of the invention, 1, 2, and 3 have the same signification as in Fig. 1. The ball 2 is here inserted in a passage 14, from the orifice of which next to the blank a portion of the ball projects. This orifice is narrowed so that the ball cannot fall out. Diametrically opposite to that portion of the ball facing the blank the ball is supported by a plate 11 fitting in the passage and backed by a threaded rod 12 passing through an eye in a lug 13 extending from the shaft of the pressing tool and held in a suitable position by two nuts 15. By this arrangement the position of the ball is made adjustable, and the ball may be introduced into the passage from behind after removing the plate 11. In other constructional forms the ball is inserted in a ball chamber as in Fig. 2, the orifice of which chamber facing the blank is too small for the ball to be introduced therethrough. When in this case the plate 11 forming the bottom of the chamber is not adjustable or removable but is integral with the shaft, the ball must be inserted in the ball chamber by other means. This may e. g. be effected thereby that the outermost portion of the ball chamber is removable and screwed on to the shaft along the dotted line x. Fig. 3 shows an arrangement where also a great portion of the ball is covered. The opening through which the ball touches the blank is, however, not bounded by a single circle with a smaller diameter than the ball, but has one or more circular lateral recesses 5 allowing the ball to be inserted in the ball chamber in certain oblique directions. The ball is backed by the spherical cup 4. The recesses 5 are preferably so located as to leave that side of the ball partly free which is first met by the blank when the latter is moved relatively to the tool. By the constructional form shown in Fig. 4, a ball cage 7 (similar to the customary pressure ball bearings) is located in the bottom of the recess 6 of the shaft wherein the ball is inserted, thus supporting the ball 2. Fig. 5 shows a single example of the manner in which the pressing tools according to the invention are combined with a machine. The pressing tool 1 with the ball 2 is rotatably mounted about a shaft 10 in some part of the machine. The counter pressure member 8 and blank 3 are, on the contrary, stationary and the axis of the counter pressure member coincides with the axis of rotation. There are several tools mounted around the axis of rotation with equidistant angular intervals. Each of the tools is pressed against the counter pressure member by a spring 9. The rotating tools are slowly lowered during the rotation towards the counter pressure member 8, or the latter is slowly moved upwards between the tools, whereby the blank is successively pressed against the counter pressure member. Besides to the machine represented in Fig. 5 the pressing tools according to the invention may be applicable also to any other machine for pressing metal, so e. g. to impressing work in a customary turning lathe. The invention is not limited to the represented ways of placing the balls or forms of the

pressing tool, but may be varied in many ways when only the principle of the invention is not left.

I claim:

5 A pressing tool for shaping metal and like materials including a body member having a recess in one terminal thereof, a spherical pressing member freely rotatable in all directions in said re-

cess and projecting from the extremity of said body member, said body member being capable of universal movement to permit application of the spherical member to a blank as desired, and an adjustable member located in said recess and forming a regulating member for the spherical member. 5

PAUL CHRISTEN CHRISTIANSEN.