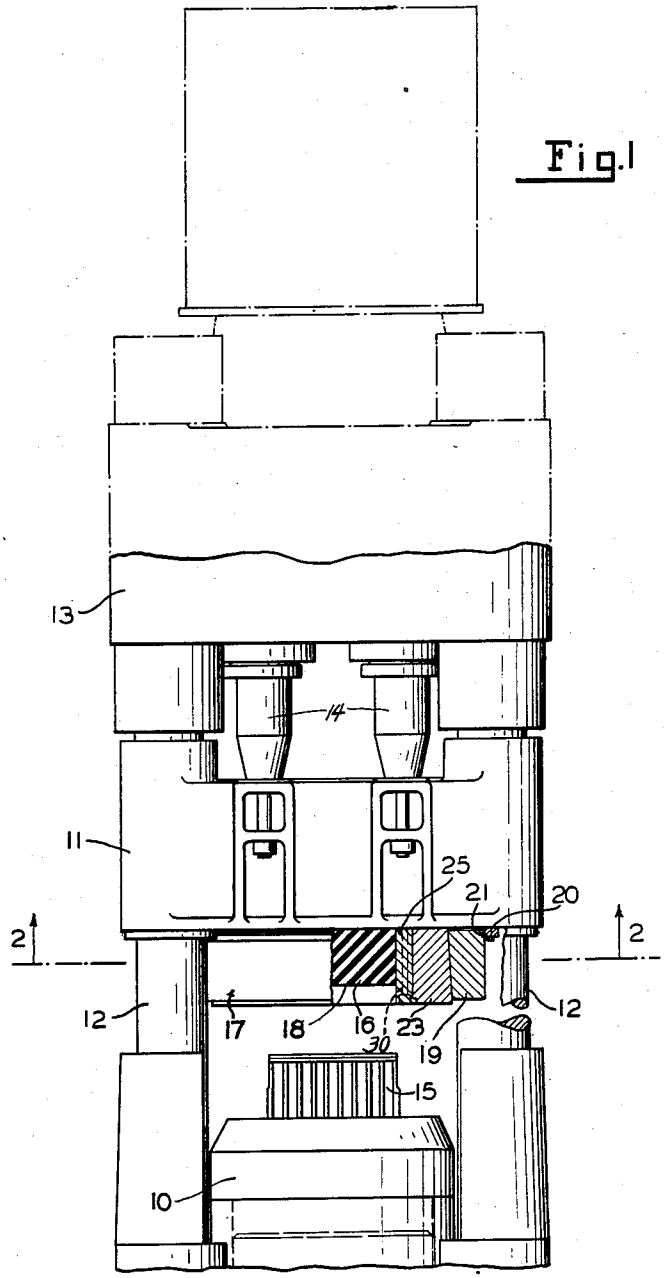
June 24, 1958 F. A. DUSSLING 2,840,025

MOUNTING FOR RESILIENT PRESS PADS OF POLYGONAL CROSS-SECTION

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Fig. 1



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Fig. 2

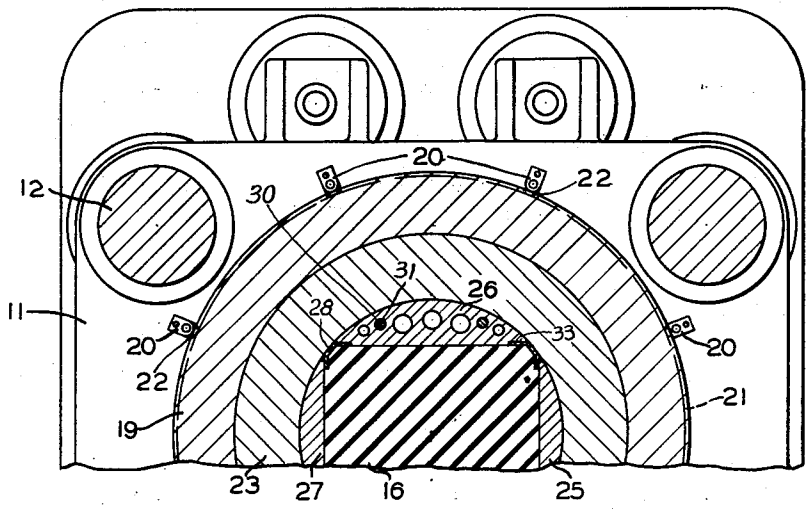
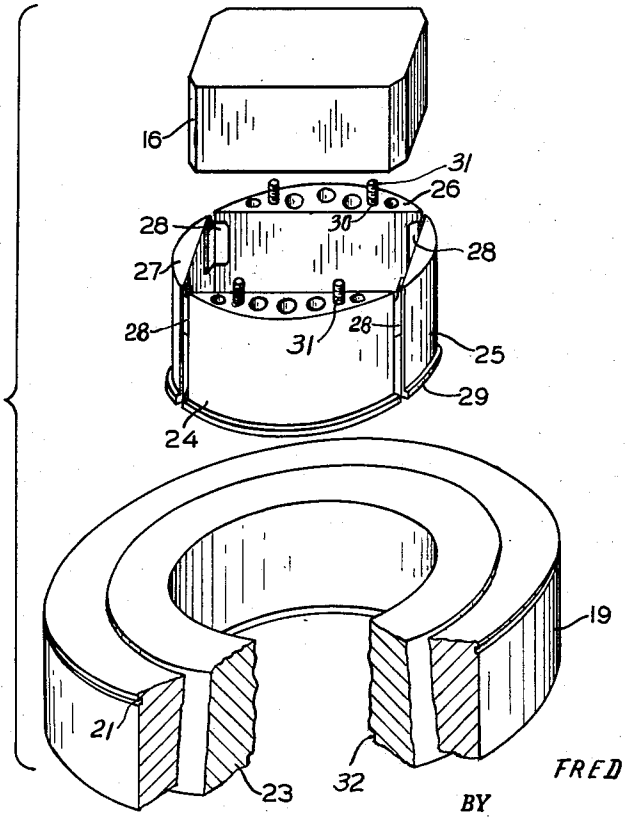


Fig. 3



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MOUNTING FOR RESILIENT PRESS PADS OF POLYGONAL CROSS-SECTION

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4 Claims. (Cl. 113—44)

This invention relates to presses and particularly to improvements in forming and drawing presses which employ press pads made of yieldable solid material such as rubber or the like.

Presses using such press pads generally include a platen which carries the press pad and which is movable towards and away from, or relative to, a table having a die set thereon, the die and the pad cooperating to form or shape sheet metal interposed between these two members. The pad is usually rectangular in form and is normally confined laterally and at one end by a box or frame of the same general form, which is attached to the platen. Prior to this invention, there were no holding means that could be considered satisfactory by present standards, for failures in such holders have been frequent and a constant source of serious and dangerous trouble, particularly on large presses which develop exceedingly large working pressures.

The object of this invention is to provide a new and improved press panholder for presses and the like, which embodies an optimum of strength, safety and serviceability.

A more particular object of the invention is to provide a press padholder which eliminates stress concentration in local points of the padholder and provides for uniform deflection in such member so as to effect uniform stresses, thereby minimizing in a practical manner structural failures that usually occur in members subjected to repeated impact loading.

A further object of the invention is to provide a new press padholder which can be installed readily on various press arrangements and which may utilize the same supporting member as is used for known padholders in presses. Still another object of the invention is to provide a press padholder having new features of flexibility such that press pads of different sizes and shapes may be used with one padholder on the same press.

These and other objects, features and advantages of the invention will become apparent from the following description of the accompanying drawings, which are merely exemplary.

Figure 1 is a front elevation, partially broken away and partially in vertical section, of an assembled press according to the invention;

Figure 2 is a fragmentary horizontal section taken along line 2—2 of Figure 1;

Figure 3 is an exploded view in perspective of the press pad assembly of the press.

Referring to the drawings, the press assembly may have a lower, upwardly facing table 10 adapted to support forming dies, and an upper platen 11 movable vertically relative to table 10 on tie rods or columns 12. An upper crosshead 13 suspends a suitable ram assembly, part of which is shown at 14 and which is operatively connected with the platen for reciprocating it vertically towards and away from table 10. A bolster member 15, fastened to the top of table 10, serves as a seat for the dies to be used

in metal forming and cooperates with other parts of the press in a manner to be described hereinafter.

An upwardly and laterally confined press pad 16 of yieldable solid material such as rubber is suspended from the underside of platen 11 in confronting relation to bolster 15 by a head indicated generally at 17. The press pad 16 has a polygonal form which may be substantially rectangular with parallel upper and lower surfaces, and is generally similar in form to known press pads. It will be understood that rubber behaves much like a liquid, being subject to many hydrostatic laws. Consequently, when the platen is forced downwardly under great force, the impact of the pad against the bolster will set up exceedingly high pressures in the pad which are the same in all directions and which cause high stresses in the pad supporting structure. Such stresses, which are repeatedly developed and then released by great impact loads, have frequently caused structural failure in prior padholders.

To reduce and eliminate such failures, the head 17 includes a padholder made in the form of a ring-shaped or substantially circular member 23. The ring 23, which is preferably open at both ends and is free of restraining flanges, underlies platen 11 and only confines the non-circular press pad 16 laterally, the pad being confined upwardly by the lower surface of the platen. In this way, the concentration of excessive stresses and the irregularities in stress distribution common in prior padholders are avoided or minimized. It is to be understood that the term "circular member" includes those members which deviate from a true circular form but which maintain uniform stress distribution when subjected to internal pressure.

As more clearly seen in Figures 2 and 3, head 17 further includes, in addition to padholder ring 23, an outer annular member or retaining ring 19 which surrounds and supports the padholder ring 23. The retaining ring is detachably fastened to the underside of platen 11, which may be of the type commonly used for known presses of this type, by a series of circumferentially spaced clamps 20, the latter being bolted to the platen and swingable when loose about the axes of the bolts to and from a position in which projecting tongues 22 of the clamps 20 engage an annular groove 21 formed in the upper portion of the outer periphery of the retaining ring, thereby holding the ring 19 stationary relative to platen 11. The outer annular surface of padholder ring 23 and the contiguous inner surface of retaining ring 19 have complementary sloping surfaces, each surface sloping downwardly and outwardly, the padholder ring being held in the retainer ring by a press fit. Such construction permits the pad supporting members to be readily aligned when assembled, thereby maintaining uniform deflection of such members under high pressures so as to insure uniform stress distribution in such members.

The pad is held in the surrounding padholder 23 by adapter segments 24, 25, 26 and 27 fitted in the clearance between the sides of the rectangular pad and the inner wall of the annular padholder 23. The segments and pad are held in assembled relation within the padholder by tabs 28, which are fixed to opposite ends of two opposing segments 25 and 27. The tabs project laterally beyond the ends of such segments and extend around the adjoining corners of the pad in gripping relation thereto and fit into recesses 33 in the opposite ends of the opposing adjoining segments 24 and 26, thereby clamping the pad within the interconnected segments. The tabs are relatively flexible so that the stress will be distributed uniformly by the pad to the ring 23. The pad is mounted in the upper portion of head 17 with its upper surface flush with the underside of platen 11 so that the pad is confined upwardly by the platen and laterally by the padholder 23, and is unconfined downwardly. The

working surface **18** of the pad is spaced inwardly from the mouth of head **17** so that the bolster will enter the opening in the head and act against the working surface of the press pad to develop the desired working pressures in the pad, the bolster being dimensioned so that it fits into the head opening with small lateral clearance.

Two opposing adapter segments **24** and **26** are formed with longitudinal extending bores **30** for receiving long-stem bolts **31**, which are adapted to extend through the segments and into tapped openings in the platen **11** for connecting the segments to the platen. The segments **25** and **27** extending transversely between the attached segments are joined to the attached segments by the tabs **28** as described above. The outer lower margin of each segment is flanged at **29**, the flange fitting into an annular channel **32** cut in the inner lower margin of padholder **23** so as to act as a safety measure for preventing vertical displacement of the segments and the padholder relative to each other.

It will be evident from the foregoing description that adapted segments of many different sizes and shapes may be used with the same padholder, thereby allowing press pads of different sizes and polygonal shapes to be used with the same circular padholder on one press. Further, the entire head **17** may be assembled as a unit before it is attached to the platen, the members of the head being held in assembled relation by suitable tight fits.

The press may be vertical or horizontal and the terms "platen" and "table" can be used interchangeably.

It is to be understood that the detailed description and the accompanying drawings are illustrative and that the improvements herein disclosed may be embodied in various forms of construction within the scope of the appended claims.

What is claimed is:

1. In a press or the like having a table member and a platen member movable towards and away from each other, the combination comprising a substantially rectangular-shaped press pad of resilient solid material adapted to be carried with one of said members and positioned to cooperate with a forming die on the other of said members as they are moved towards each other for forming the material, a mounting for said press pad, said mounting including a substantially circular holder open at both ends surrounding said press pad and laterally confining it, adapter segments to fit between the lateral walls of the press pad and the inner wall of said holder, and flexible means in gripping relation to said press pad connecting adjoining ends of said adapter segments.

2. In a press or the like having a table member and a platen member relatively movable toward and away from each other, the combination comprising a press pad of polygonal cross-section of resilient solid material, and a mounting therefor, said mounting including a holder surrounding said press pad and having a substantially circular inner wall laterally confining said pad, and

a plurality of adapter segments filling spaces between said inner wall and the adjacent sides of said press pad, each of said segments having an arcuate outer surface fitting said circular inner wall and a flat inner surface engaging a single side of the press pad, whereby said segments in said holder rigidly support the sides of said pad and distribute evenly to said holder lateral stresses exerted by the pad during a forming operation.

3. In a press or the like having a table member and a platen member relatively movable toward and away from each other, the combination comprising a substantially rectangular press pad of resilient solid material, and a mounting therefor, said mounting including a holder surrounding said press pad and having a substantially circular inner wall laterally confining said pad, and four adapter segments filling spaces between said inner wall and the adjacent sides of said press pad, each of said segments having an arcuate outer surface fitting said circular inner wall and a flat inner surface engaging a single side of the press pad, whereby said segments in said holder rigidly support the sides of said pad and distribute evenly to said holder lateral stresses exerted by the pad during a forming operation.

4. A mounting for resilient press pads of polygonal cross-section and of different sizes, comprising a rigid substantially circular member of a size sufficient to surround any one of said pads, and a set of adapter segments for each of said pads to fit between the inner wall of said circular member and the sides of the respective pad for holding said pad in said member and confining it laterally, the outer surface of each of said segments being shaped to engage the inner wall of said circular member and the inner surface of each of said segments being shaped to engage a single side of the respective press pad, the number of segments in each set being the same as the number of sides of the respective press pad of polygonal cross-section.

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