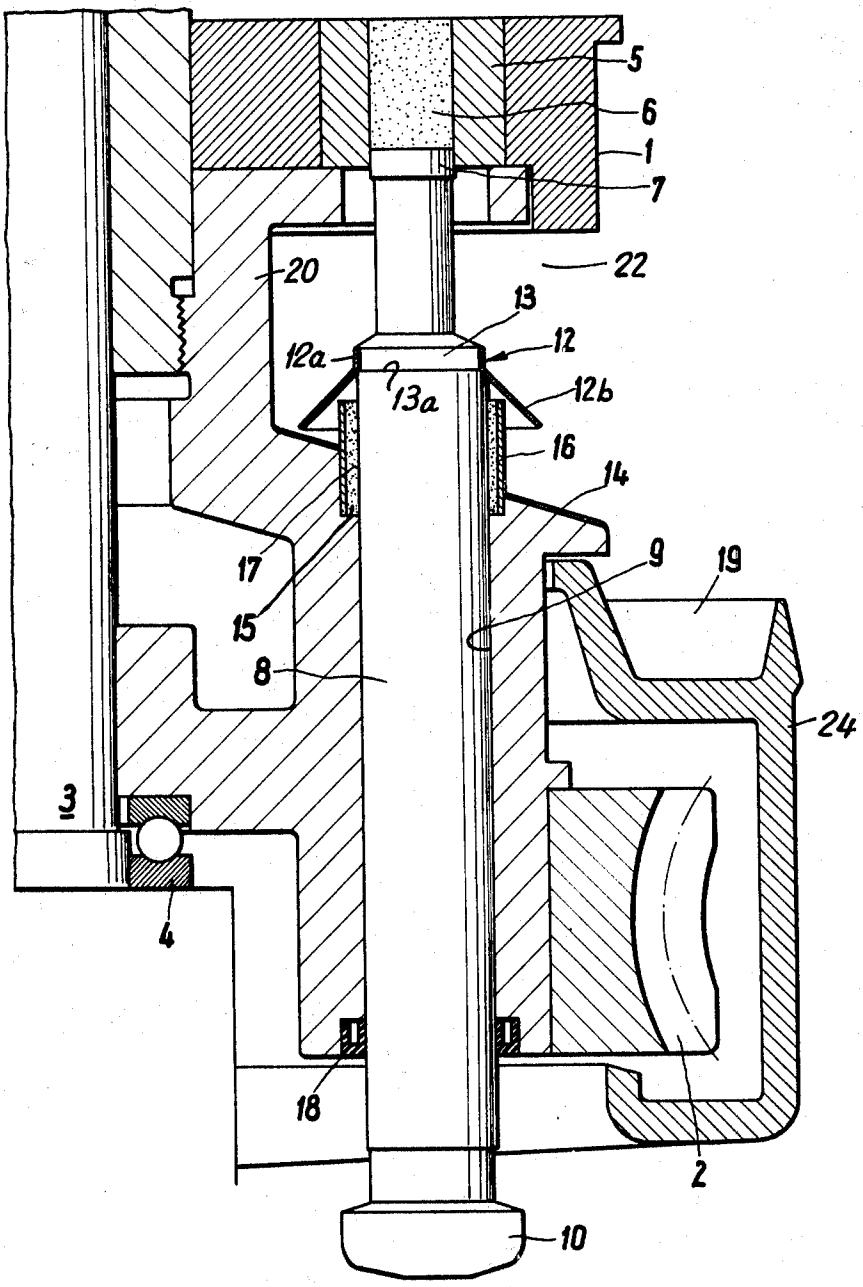
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TABLET PRESS

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Inventor:
EMIL KORSCH

BY McGlew & Toren
ATTORNEYS.

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TABLET PRESS

Emil Korsch, Berlin, Germany, assignor to Firma Emil Korsch Spezialfabrik fur Komprimiermaschinen, Berlin, Germany

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This invention relates in general to the construction of presses and to a new and useful circular tablet press having a die table with a bottom punch which reciprocates in a lubricated shank guide which is protected against dust.

Circular motion tablet presses have a die table with dies in which the charge press mass is compressed between a bottom punch and a top punch and the formed tablet is ejected from the die by the upward movement of the bottom punch. During the operation of such device dust from the press operation falls past the bottom punch into the guide for the shank portion of the punch and causes the rapid wear and dirtying of these operating parts. Attempts have been made to remedy this situation such as by using bellow-type cuffs but such an arrangement has the disadvantage that the bellows must be fastened to the bottom punch shank and to the die table and it prevents the easy removal or changing of the bottom punch. For this reason the packings for such bellow-type cuffs have been unacceptable. A further disadvantage of using bellows is that the bottom punches must be mounted so that they cannot rotate and this is of particular disadvantage in the manufacture of round tablets because the heads of the bottom punch shanks will have a longer life if they can be continuosuly rotated or rolled off as they pass the curved tracks or cam plates and pressure rolls. In addition, circular motion tablet presses are constructed such that they have low structural height and will not easily accommodate bellow-type cuffs.

In accordance with the present invention there is provided a construction which includes a press having a press table having a lower portion with a bottom punch shank guide. The guide is formed at its upper end with a recess for a tubular cup which may be filled with a lubricant for lubricating the upper end of the punch shank. In addition, the shank is formed with a widened flange portion around which is positioned a conical hat cuff which is adapted to overlie and protect the tubular lubrication receptacle. With a shank construction of this nature, it is possible with circular motion tablet presses to avoid the use of conventional bellow cuffs and the construction is such that it will not hinder the rotating or rolling movement of the heads of the bottom punch shanks when they engage the curved tracks and pressure rolls during the operation.

A feature of the construction is that the die table or the punch guide includes a cutout portion immediately below the die. This cutout portion includes a sloping wall immediately below the bottom exit opening of the die. Any dust which falls out of the die upon removal of the punch will be deflected by the cuff onto the inclined wall which will direct the dust material downwardly into a receptacle portion. The inclined wall is also provided with a cutout for a tubular lubrication holder or shell reservoir which is adapted to contain lubrication and which is positioned around the shank of the punch directly below the cuff in the lowermost position of the bottom punch so that the lubricant will be shielded from any dust material. By locating the lubricating chamber around the punch shank at the upper end thereof, the punch will be lubricated along its length down to the packing at the lower end of the guide. Because the punch can rotate, the conically shaped hat will also rotate with it and

the tendency will be to throw the dust outwardly under the centrifugal force action produced. In the preferred form, the shell forming the oil reservoir around the upper end of the shank of the punch is mounted within a recess in the inclined wall, so that it can be easily removed for inspection or cleaning, if desired. Oil and dust will fall downwardly along the inclined wall into a collecting trough which is easily accessible so that it may be emptied of dust regularly. The dust trough is also located so that it will receive any oil from the oil reservoir when the shell forming the reservoir is removed from the recess in the table. Since the entire table rotates, the inclined wall of the cutout portion of the table will also rotate so that the centrifugal force will cause the particles to be thrown downwardly and outwardly.

Accordingly, it is an object of the invention to provide a press having a movable bottom punch which moves upwardly slightly out of a die for the removal of the tablet article which is compressed and which includes a conical cuff carried by the shank of the bottom punch for the deflection of dust material away from the associated lubricated bearing portions of a guide member for the punch.

A further object of the invention is to provide a circular motion tablet press including a die table with a cutout portion formed below the die and a lower guide portion for mounting a bottom punch for reciprocal and rotative movement into and out of the die formed at the table portion located thereabove and which includes an inclined wall in a cutout below the table in which is located a recess for a tubular shell forming a lubricating supply which extends around the punch, and wherein the punch carries a cuff of conical configuration effective to deflect dust material onto the inclined wall which leads downwardly into a collecting trough, and wherein any oil which may issue out of the reservoir formed by the tubular shell will flow downwardly along this wall into the collecting trough.

A further object of the invention is to provide a circular motion tablet press which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

The only figure of the drawing is a partial radial sectional view of a tablet press constructed in accordance with the invention.

Referring to the drawing in particular, the invention embodied therein comprises a tablet press which includes a table lower part **1** which, together with a guide member or table body **20**, is mounted for rotation about a column **3**. The rotation is effected through a driven worm wheel **2** which is carried on the lower end of the guide member **20**. The guide table **1** contains a matrix or die **5** into which the press mass **6** is filled and compressed to form tablets. The tablets are formed from the mass by the action of an upper die punch (not shown) and a bottom punch **7**. The bottom punch **7** is carried on a shank member **8** which is guided in a shank guide or bore **9** formed in the guide member **20**. The guide member **20** may be formed integral with the table **1** or as a separate part, as indicated, and it is provided with a cutout portion or open area **22** immediately below the die **5**. The shank **8** terminates at its lower end in a head portion **10** which is adapted to run over curved tracks or cam plates (not shown).

In accordance with the invention, the shank **8** is provided with a machined-on annular surface **13** forming a ledge **13***a* which provides a support for a cylindrical portion **12***a* of a conical cuff plate **12**. A lower conical portion **12***b* of the plate **12** extends downwardly from the cylindrical portion **12***a* and in accordance with the invention overlies an oil or lubricant reservoir **17** formed by a removable shell member **16**.

A feature of the invention is that the cutout portion **22** is bounded at the lower end by an oblique or downwardly inclined wall **14** which provides a means for deflecting any dust material or oil dropping thereon into a trough **19** which is formed on the upper end of a gear casing **24** and located at the lower end of the inclined wall **14**. In the lowermost position of the cuff member **12** it will clear the upper portion of the inclined wall **14**, as indicated in the drawing. In order to accommodate the cylindrical shell **16**, guide member **20** is advantageously provided with a cylindrical depression **15** and the shell **16** is removably inserted therein. In some instances it is desirable to attach the shell **16** in position such as by welding or by other suitable connecting means. By making the shell **16** detachable, however, it is easy to clean the interior of the shell. When the shell is removed, it is merely lifted up and any oil such as the lubricant **17** which is contained therein will move downwardly over the inclined wall **14** into the trough **19**. When the shell **16** is filled with lubricant **17**, the lubricant provides a seal for the whole shank guide **9** and provides a good permanent lubrication of the shank guide and the sealing of the guide against dust. The lower end of the guide **9** is provided with a packing **18**.

It should be noted that in the lowermost position, as indicated in the drawing, the cuff **12** engages over the uppermost edge of the lubricant reservoir **17** and insures that guide **9** will be protected against dust in the most endangered position of the bottom punch **7**.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A tablet press comprising a press die table having a die opened at each end for the reception of a material to be pressed therein, a guide member located below said die having a guide bore, a bottom punch having a punch reciprocal in said die and a shank portion reciprocal in said guide bore, means defining a lubrication reservoir adjacent the upper end of said guide bore around said punch shank portion, and a conical hat cuff secured around said bottom punch shank portion above said reservoir and below said die for deflecting dust material exiting from said die away from said reservoir.

2. A tablet press according to claim **1**, wherein said bottom punch is movable between predetermined limits and wherein at the lowermost limit the movement of said punch said means defining said lubrication reservoir extends upwardly into said cuff.

3. A tablet press according to claim **2**, wherein said means defining said lubrication reservoir includes a tubular shell member carried on said guide member and projecting upwardly therefrom.

4. A tablet press according to claim **1**, wherein said means defining a lubrication reservoir adjacent the upper end of said guide includes a cylindrical recess defined in said guide member at the upper end of said bore opening at the top, and a cylindrical shell positioned in said recess and forming the outer boundary of said lubrication reservoir.

5. A tablet press according to claim **1**, wherein said guide includes an inclined wall below said die slanted downwardly and outwardly for directing dust outwardly and downwardly.

6. A tablet press according to claim **5**, including a trough formed at the lower end of said inclined wall for collecting dust directed downwardly therefrom.

7. A tablet press according to claim **5**, wherein the upper end of said guide bore is provided with an enlarged recess, said means defining a lubrication reservoir including a shell placed in said recess and projecting upwardly therefrom, and a trough located at the lower end of said inclined wall for receiving dust thrown off by said wall and oil from said lubricating reservoir when said shell is removed.

8. A tablet press according to claim **7**, wherein said enlarged recess formed in the inclined wall of said guide includes a portion at the lowermost end of said inclined wall which is substantially at the level of said inclined wall.

9. A tablet press according to claim **1**, including means mounting said table for rotation about an axis substantially parallel to the movement of said bottom punch axis.

References Cited

UNITED STATES PATENTS

2,043,086	6/1936	Westin et al.	107—17
2,225,145	12/1940	Baumbach	308—5
2,776,173	1/1957	Rudy	308—5

WALTER A. SCHEEL, *Primary Examiner.*

A. O. HENDERSON, *Assistant Examiner.*