

No. 697,550.

Patented Apr. 15, 1902.

C. H. SCOTT.

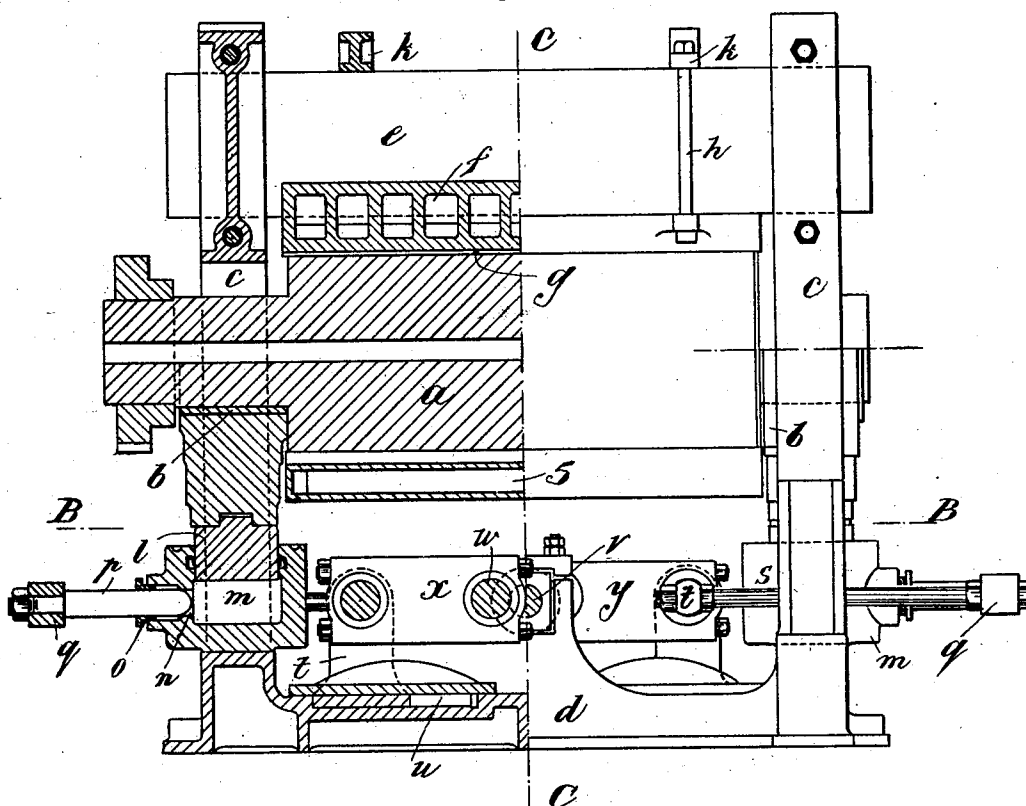
PRESS FOR PRESSING LINOLEUM, &c.

(Application filed Feb. 27, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1



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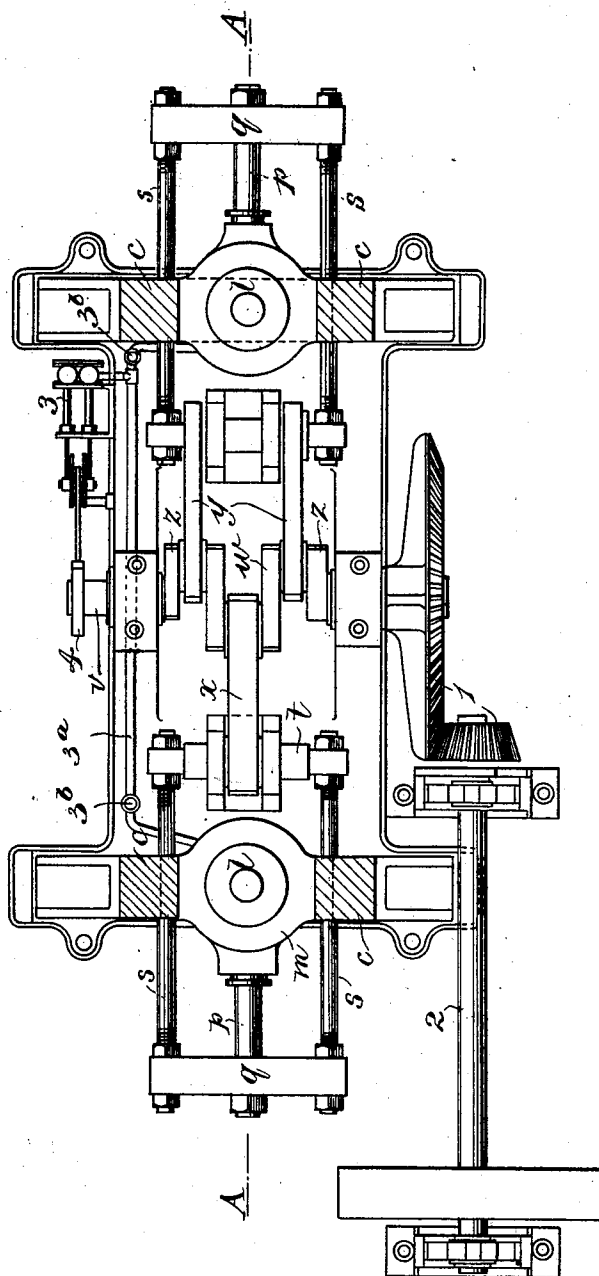
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3 Sheets—Sheet 2.

Fig. 2.



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Fig. 4.

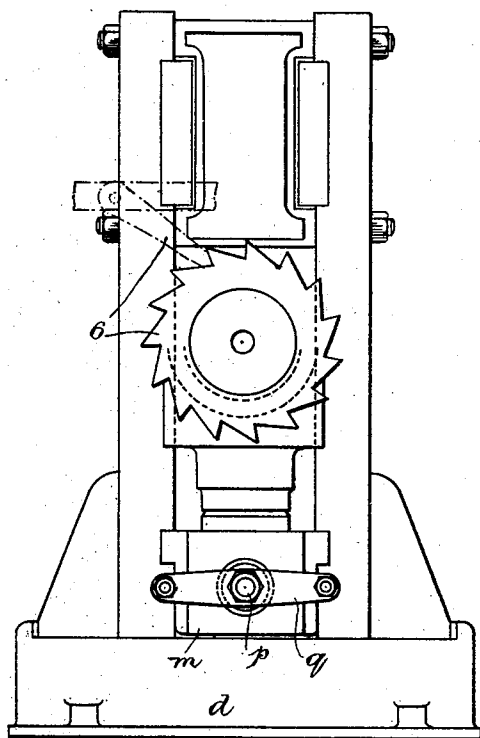
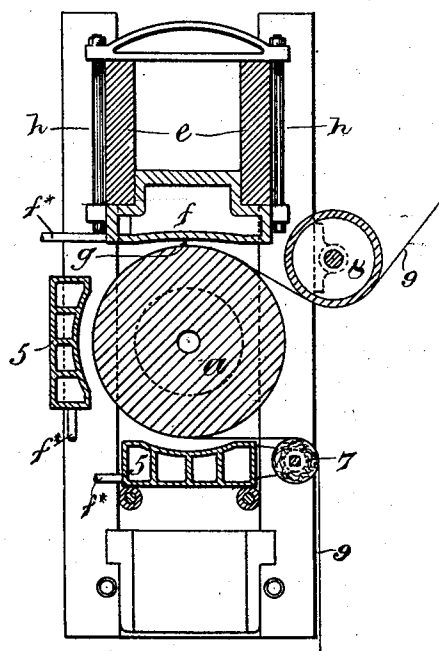


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PRESS FOR PRESSING LINOLEUM, &c.

SPECIFICATION forming part of Letters Patent No. 697,550, dated April 15, 1902.

Application filed February 27, 1901. Serial No. 49,093. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HERBERT SCOTT, a subject of the King of Great Britain and Ireland, residing at Gloucester, England, have invented Improvements in Presses Suitable for Pressing Linoleum and Similar Material, of which the following is a specification.

Presses suitable for pressing linoleum and similar material have been constructed wherein a movable press-head is carried by a hydraulic ram, the cylinder of which is in free and open communication with a main pump barrel or cylinder having a reciprocating plunger driven from a continuously-running crank, so that the movable press-head can be caused to rapidly reciprocate and pressure be applied to and removed from the material under treatment in rapid succession, an auxiliary pump of variable capacity being provided in connection with the ram-cylinder to supply water to such cylinder on the out-stroke of the pump-ram to make up for any leakage and a loaded safety-valve being provided to allow of the escape of superfluous water from the said cylinder when a predetermined pressure is reached during the instroke of the pump-plunger. In such presses and also in other presses for pressing material of the kind referred to it has heretofore been usual to employ a reciprocating press-head having a flat pressing-face, which it has been found necessary to cover with fabric, such as linen, coated with a greasy substance, or to use loose metal plates similarly coated with a greasy substance, in order to prevent the material from adhering to the face of the press-head. The use of such fabric or plates increases the cost of the pressing operation and also results in an inferior finish being imparted to the pressed material; and this invention has for object to obviate these disadvantages. For this purpose a press according to this invention is constructed with a metal roll, such as a chilled-iron roll, the peripheral surface of which is kept in a greasy condition during use, and with a hollow press-head or cover, (hereinafter called the "pressure-plate,") which on the side next the roll is made more or less concave, the arrangement being such that material fed between

the roll and pressure-plate will upon the roller being moved toward the pressure-plate or the pressure-plate being moved toward the roll be subjected to pressure between the two, the face of the material, which is arranged to come in contact with the roll, easily leaving the surface of the latter at each forward feeding movement thereof which takes place during the backward movement of the roll or of the pressure-plate, as the case may be.

Presses having a pressing-roll and a pressure-plate having a concave pressing-surface, as described, with means for moving the roll or the pressure-plate toward and from the material to be treated, can be constructed in various forms.

Figure 1 shows, partly in side elevation and partly in longitudinal section on the line A A of Fig. 2, and Fig. 2 in horizontal section on the line B B of Fig. 1, one construction of machine according to this invention. Fig. 3 is a cross-section on the line C C of Fig. 1, and Fig. 4 is an end view of the machine.

In this construction the pressing-roll *a* is mounted at its ends in bearings *b*, arranged to slide vertically in end frames *c*, that are fixed to a suitable base-plate *d* and carry at their upper ends longitudinal bars or members *e*, to which the hollow pressure-plate *f*, which is made concave on its lower side *g*, is suitably secured, as by bolts *h* and cover-pieces *k*. The two roll-bearings *b* are connected to rams *l*, arranged to work vertically in cylinders *m*, each of which is provided on its outer side with a lateral passage *n* and stuffing-box *o*, through which works the inner end of a horizontal plunger *p*, the outer end of which is fixed to a cross-head *q*. Each cross-head *q* has connected to it the outer ends of a pair of rods *s*, that extend through the adjacent end frame *c* and have their inner ends connected to a second cross-head *t*, that is arranged to slide in a suitable guideway or guideways *u* and is reciprocated from a transverse crank-shaft *v*, common to the two sets of cross-heads and plungers. One of the cross-heads *t* is driven from a centrally-arranged crank *w* through connecting rod or link *x*, and the other cross-head *t* is driven through a pair of connecting rods or links *y* from a pair of cranks *z*, arranged one on each

side of the central crank *w*, these two cranks being arranged directly opposite to the other. As will be seen, the arrangement is such that the two plungers *p* will be caused to make their instrokes and outstrokes together, so as to cause the two rams *l* to move upward and downward together, and that the instrokes of the plungers will be effected by the outward strokes of the cranks—that is to say, by the movement of the cranks in a direction away from the plungers *p*, so as to obtain a dwell at the point of greatest pressure, due to the fact that the curves of movements of the cranks and connecting-rods at the points of greatest pressure are both convex. The crank-shaft may be rotated in any suitable way—as, for example, through bevel-gearing 1 from a belt-driven shaft 2. A small auxiliary pump 3, which may be of adjustable stroke and be driven from an eccentric 4 on the crank-shaft *v*, is provided for supplying water through pipes 3^a to the ram-cylinders *m* on the outstrokes of their horizontal plungers *p* in order to compensate for leakage past the packing-leathers and stuffing-boxes, loaded safety-valves 3^b being provided to allow of the escape of superfluous water from the said cylinders on the instrokes of the plungers after a predetermined pressure has been reached in the said cylinders, as in the known construction of press hereinbefore referred to.

The apparatus may be provided with hollow hot plates 5, one of which may be arranged below the roll and the other at the back thereof, and both of which, as well as the hollow pressure-plate *f* at the top, are provided with means whereby they can be heated by steam or otherwise, as may be desired. Steam-pipes *f* are shown in Fig. 3 for the purpose mentioned. The roll *a* is provided with means—for example, ratchet mechanism 6—whereby it can be partly turned between successive strokes of the rams, and it may be with means whereby it can be heated internally. The apparatus is also provided with suitable guide-rollers 7 and 8, whereby the material 9 to be pressed can be led into the machine between the lower hot plate 5 and the bottom of the roll *a* and led away therefrom between the top pressure-plate *f* and the top of the roll, the material passing partly around the roll *a* with its face adjacent to the surface thereof.

In the working of the press the material 9—for example, linoleum consisting of a backing, to one side of which a layer of linoleum mixture has been previously applied in another machine—is drawn in an intermittent manner and in the direction indicated through the press, wherein it is subjected to pressure between the pressure-plate *f* and the greased roll *a*, which is caused to rapidly reciprocate to and from the pressure-plate by the means described, so that the said material will be subjected to pressure that is applied and removed in rapid succession—say at the rate of twenty to thirty times per minute—the pres-

sure at each forward—*i. e.*, inward—stroke of the pump-plungers *p* being gradually applied up to a predetermined point and afterward caused to remain constant—*i. e.*, to dwell—for the remainder of the stroke and the material being moved forward a short distance at each backward stroke of the pump-plungers, the said material finally passing off clear of the roll. In this way linoleum and like material can be consolidated in a rapid, advantageous, and economical manner and without liability of its adhering to the surface of the roll, and thereby becoming injured.

What I claim is—

1. In a press suitable for pressing linoleum and similar material, the combination of a roll, a pressure-plate arranged adjacent to and made concave on the side next said roll, reciprocating means connected to one of said parts for moving it toward and from the other part and means for actuating said reciprocating means so as to subject material located between them to intermittent pressure.

2. In a press suitable for pressing linoleum and similar material, the combination of a roll, a pressure-plate arranged adjacent to and made concave on the side next said roll, hydraulic rams connected to one of said parts for reciprocating it toward and from the other part, hydraulic pumps adapted to reciprocate said rams, and means for reciprocating the pump-plungers and causing them to make their instrokes and outstrokes together.

3. In a press suitable for pressing linoleum and similar material, the combination of a roll, a pressure-plate arranged adjacent to and made concave on the side next said roll, hydraulic rams connected to one of said parts for reciprocating it toward and from the other part, hydraulic plunger-pumps adapted to reciprocate said means, means for reciprocating the pump-plungers and causing them to make their instrokes and outstrokes together, an auxiliary pump adapted to supply water to the main pumps, on the outstrokes of their plungers, and safety devices adapted to allow of the escape of surplus water from said main pumps on the instrokes of their plungers.

4. A press suitable for pressing linoleum and similar material, comprising a pressure-plate having a concave pressing-face, a roll arranged in proximity to the concave face of said plate, hydraulic rams connected to one of said parts for reciprocating it toward and from the other part, hydraulic plunger-pumps for operating said rams, and oppositely-arranged rotary cranks for operating said pumps.

5. A press suitable for pressing linoleum and other material, comprising a stationary frame, a hollow pressure-plate fixed thereto and having a concave pressing-face; means for heating said pressure-plate, a roll arranged parallel to said pressure-plate and adjacent to its concave face, means for reciprocating said roll to and from said pressure-plate, means for rotating said roll in an intermit-

tent manner, and means for guiding material to be pressed between said pressure-plate and roll.

6. A press suitable for pressing linoleum and other material, comprising a stationary frame, a hollow pressure-plate fixed thereto and having a concave pressing-face, means for heating said pressure-plate, a roll arranged parallel to said pressure-plate and adjacent to its concave face, means for reciprocating said roll to and from said pressure-plate, hollow hot plates arranged at the back of and below said roll, means for heating said pressure and hot plates, and means for guiding material to be pressed between said roll and the hot and pressure plates, substantially as described.

7. In a press suitable for pressing linoleum and similar material, the combination of a roll, a pressure-plate arranged adjacent to and made concave on the side next said roll, hydraulic rams connected to one of said parts for reciprocating it toward and from the other part, hydraulic plunger-pumps adapted to reciprocate said rams, and cranks connected to said plungers and arranged to cause them to make their instrokes while the cranks are turning in a direction away from said plungers.

8. A press suitable for pressing linoleum and similar material, comprising a stationary frame, a hollow pressure-plate fixed to the upper part thereof and having a concave lower pressing-face, a roll arranged below said pressure-plate, mounted in bearings arranged to reciprocate in said frame, and provided with means for rotating it, hydraulic cylinders fixed to said frame and fitted with rams connected to said bearings, hydraulic plungers arranged to compress water within said cylinders, cranks and connections for reciprocating said plungers, an auxiliary pump connected to said hydraulic cylinders and adapted to supply water thereto on the outstrokes of their plungers, and safety-valves to allow of escape of surplus water from said cylinders after a predetermined pressure has been reached on the instroke of said plungers, substantially as described.

9. In a press suitable for pressing linoleum and other material, the combination of a stationary pressure-plate having a concave pressing-face, a roll arranged parallel to said pressure-plate and near to its concave face, bearings for said roll, hydraulic rams connected to said bearings, guideways for said bearings, hydraulic cylinders for said rams, a crank-shaft located between said hydraulic cylinders, plungers arranged at the outer side of said cylinders and capable of compressing liquid within said cylinders, and driving means between said crank-shaft and plungers for causing the latter to make their instrokes and outstrokes together.

10. In a press suitable for pressing linoleum and other material, the combination of a stationary pressure-plate having a concave press-

ing-face, a roll arranged parallel to said pressure-plate and near to its concave face, bearings for said roll, hydraulic rams connected to said bearings, guideways for said bearings, hydraulic cylinders for said rams, a shaft located between said hydraulic cylinders and provided with cranks arranged opposite to each other, plungers arranged at the outer side of said cylinders and capable of compressing liquid within said cylinders, and driving means connecting the outer ends of said plungers to the oppositely-arranged cranks, substantially as described.

11. A press suitable for pressing linoleum and other sheet material, comprising a stationary frame, a pressure-plate fixed to the upper part of said frame and having a concave pressing-face, a roll arranged horizontally below said pressure-plate and near to the concave face thereof and mounted in bearings arranged to work in guideways in said frame, vertical hydraulic cylinders fixed to said frame and provided with rams connected to said bearings, horizontal plungers arranged to work through the outer sides of said cylinders, a transverse rotary shaft located between said cylinders and provided with three cranks two of which are arranged directly opposite to the third, means connecting two of said cranks to the outer end of one plunger and the third crank to the outer end of the other plunger, a pump adapted to supply liquid to said cylinders on the outstroke of their plungers, and safety-valves adapted to allow of escape of surplus water from said cylinders on the instroke of said plungers, substantially as described.

12. A press suitable for pressing linoleum and similar material, comprising a stationary frame, a hollow pressure-plate fixed to the upper part thereof and having a concave pressing-face, hot plates fixed to the back and lower part of said frame, means for heating said plates, a roll mounted below said pressure-plate, vertical hydraulic cylinders fixed to said frame and fitted with rams carrying bearings in which said roll is mounted, horizontal plungers working in the outer side of said cylinders, separate pairs of inner and outer cross-heads connected together and to the outer end of each plunger, a transverse crank-shaft arranged between said cylinders and having oppositely-arranged cranks connected to the inner cross-head of each plunger, means for rotating said shaft, an auxiliary pump driven from said shaft and connected to said cylinders, safety-valves for escape of surplus water from said cylinder, and means for guiding the material to be pressed between said roll and the hot and pressure plates, substantially as described.

Signed at Gloucester, England, this 9th day of February, 1901.

CHARLES HERBERT SCOTT.

Witnesses:

CHARLES HENRY SUMSION,
WM. J. H. PALIN.