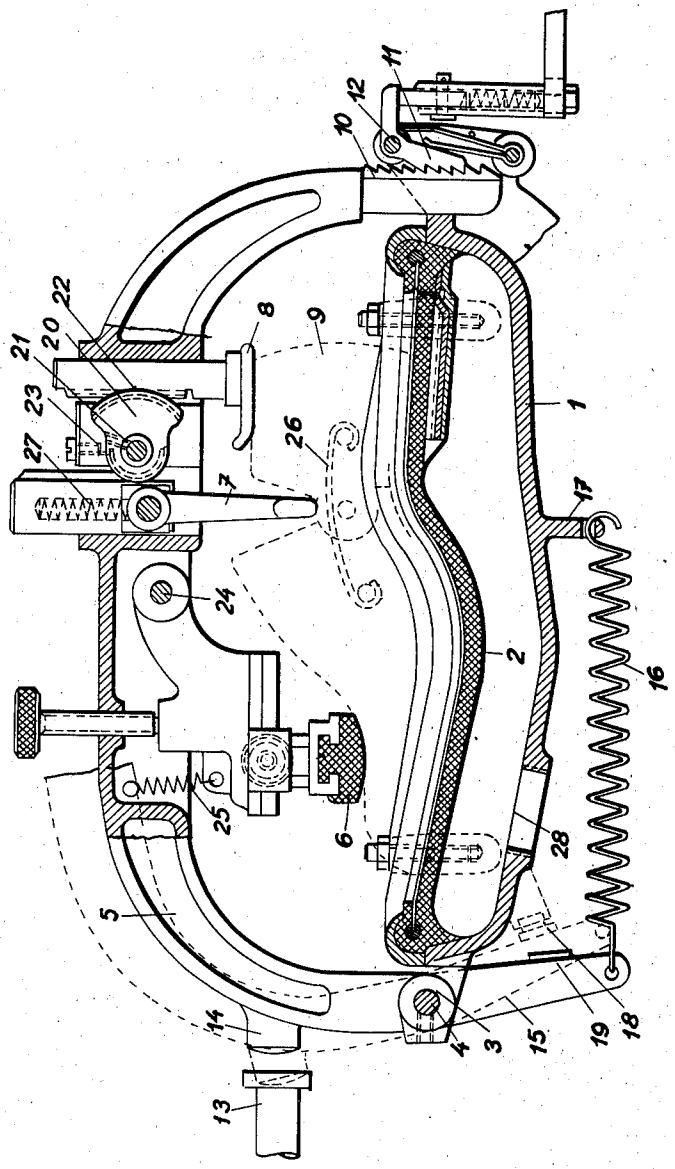
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PRESS FOR ADHESIVE UNION OF SHOE SOLE COMPONENTS

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PRESS FOR ADHESIVE UNION OF SHOE SOLE COMPONENTS

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This invention relates to an improved press for use in the operation of uniting sole components to the remainder of shoes by adhesion, for example in accordance with the Ago process, for which operation a shoe is supported by a collapsible last.

In the aforesaid operation, as carried out by the presses heretofore customary, pressure was exercised upon the lasted shoe at two places, namely on the toe and on the heel. No pressure whatsoever was applied between these places. Now, the collapsible lasts used are composed of a toe component and a heel component interconnected by means including a spring, and therefore it has transpired that the application of pressure to these two parts but not to the interconnecting means has the harmful effect of forcing upon the said means a reactionary upthrust. The interconnecting means, especially the spring, suffers from such upthrust and in course of time becomes so defective as to be more or less useless, as deformation of the shoes results from use of such a defective last.

In the present specification and in the claims, the term "shoes" is used to mean shoes, boots, and such like articles of footwear in general.

An object of this invention is to provide an improved press having means for imparting pressure to a lasted shoe not only at the toe and at the heel but also at an intermediate place. In use of such a press, the interconnection between the components of the collapsible last are safeguarded against harmful upthrust.

Another object of the invention is to provide means for automatically proportioning the additional intermediate pressure in relation to the other pressures.

Another object of the invention is to effect the desired automatic proportionment by appropriately coupling the means for applying the additional intermediate pressure to the means for applying pressure, say, to the heel.

Another object of the invention is to provide the press with an improved clamping yoke for applying the requisite clamping pressures to the respective places on the lasted shoe.

Other objects of the invention will be apparent from the following specification and claims.

The invention will now be described by way of example with reference to the accompanying drawing which shows the improved press diagrammatically in sectional elevation.

The press includes a base 1 to which is attached in known manner a bladder 2 incorporating a seat for the sole of each shoe to be acted upon, the bladder being made of resilient material such as some appropriate sort of rubber and being adapted to form with the base 1 an air cushion. Compressed air is admitted to the cushion through an opening 28, for example under the control of a regulatable valve (not shown). The base 1, at its rear or operating end, is provided with a lug 3 to which a clamping yoke 5 is pivotally connected by a bolt 4.

The yoke 5 is fitted with three suspensory pressers, namely: a presser 6 to act on the toe of the lasted shoe, a presser 8 to act on the heel of the last 9 and an intermediate presser 7 to act at an intermediate place on the last, which is represented by thin lines in the drawing. The front end of the yoke 5 is arranged to pass through an opening for it in the base 1 and is made as a ratchet-toothed rack 10 engageable by a complementary toothed self-locking detent or pawl 11 whenever the yoke is pressed down into its operative position to close the press. The yoke is shown in this position by full lines in the drawing. The detent 11 is formed as a bellcrank lever fulcrumed at 12 on the base 1, one arm of said lever being toothed as aforesaid to lock the yoke 5 automatically and the other arm being provided to facilitate retraction of the detent to release the yoke in order that it can be raised to open the press for insertion of a lasted shoe or for removal of such. The detent is normally urged to maintain its locking position by a spring 11a.

The yoke has an abutment 14 to which can be applied a plunger 13 actuated by power—for example pneumatic power—to exercise to requisite press-closing pressure on the yoke about the pivot bolt 4. The plunger 13 acts in opposition to a press-opening spring 16 which is anchored to a lug 17 on the underside of the base 1 and which is connected to a downward extension 15 of the yoke below the pin 4. The yoke is partly shown in its fully raised position by dotted lines. This position is defined by a limit abutment 18 on the base and a co-operating face 19 on the extension 15.

The spring 16 acts to open the press whenever the detent 11 is retracted to free the yoke 5. Retraction of the detent is automatically effected by means provided for the purpose, such means being actuated after deflation of the air cushion 1, 2.

An automatic pressure-proportionating device is interposed between the heel-presser 8 and the mid-presser 7 to ensure that, when the press is closed, the pressures exercised by these two

pressers are maintained equal or in some other predetermined proportional relationship. This device comprises a doubly toothed coupler **20** which is journalled on a pin **21** on the yoke **5** and which has, on the one hand, teeth **22** meshing with rack teeth on the heel-presser **8** and, on the other hand, teeth **23** meshing with rack teeth on the carrier **7***a* of the mid-presser **7**. The mid-presser is pivotally attached to its carrier, and the carrier is slidably mounted in the yoke **5**, being pressed downwards by a spring **27**.

Regarding the toe-presser **6**, this is adjustably mounted on a carrier **6***a* which is pivotally attached at **24** to the yoke **5** and which is maintained by a spring **25** against a screw-adjustable abutment **6***b*.

Regarding the last **9**, this is of the collapsible type, consisting of a toe portion and a heel portion which are pivotally interconnected by means including a spring **26**. It is this spring in particular which is so seriously stressed and in course of time damaged when such a last is used in the presses heretofore known and which is safeguarded by adoption of a press having a mid-presser **8** such as hereinbefore described with reference to the accompanying drawing.

The proportional relationship or ratio between the pressures exercised by the heel-press and the mid-press are determined by the pitch-circle radii of the teeth **22** and **23**, respectively. The proportionality may advantageously be such that said pressures equal one another, so that the pressure exercised by the mid-presser will be of the magnitude of the pressures exercised by the heel and toe pressers.

The operation of the press is as follows: The last **9** with a shoe on it is placed on the air-cushion seat **2**, the press being open and the cushion being deflated. The plunger **13** is activated and accordingly the press is closed upon the lasted shoe, the yoke being locked against retrograde movement by the detent **11**. The cushion is now fully inflated with compressed air so that the shoe is held firmly in place between the pressers **6**, **7**, **8** above and the inflated cushion **2** below, all in readiness for the necessary operations or treatment to be performed on the lasted shoe. Thereafter the air-cushion seat is deflated, the detent **11** is retracted, and the yoke is raised. Thus the shoe may be removed from the open press and replaced by another.

In the closure of the press, the pressure-proportionating device automatically operates to cause a uniform proportionment of the pressure applied by the heel-presser **8** and the mid-presser **7**. This pressure is maintained until the press is put out of operation on deflation of the air-cushion seat.

I claim:

1. A press for applying pressure to a shoe supported by a last and comprising a yoke, a plurality of pressers for applying pressure to the last at spaced places thereof, said pressers being mounted on said yoke and being individually movable in relation thereto, and means coupling said pressers together so that when either of them is moved said means constrains the other to move oppositely and to a proportionate extent.

2. In a press for applying pressure to a shoe supported by a last and comprising a toe presser and a heel presser, an additional presser mounted intermediate said toe presser and heel presser, means for applying said additional presser to the last at a place intermediate places of application of said toe and heel pressers, and means coupling one of said two first-mentioned pressers to said additional presser to maintain a predetermined proportionality between the pressures applied by the respective pressers.

3. A press for clamping a shoe supported on a collapsible last consisting of a toe component, a heel component and a pivotal connection between said components, said press comprising a toe presser to apply pressure to said toe component, a heel presser to apply pressure to said heel component, an additional presser to apply pressure to said pivotal connection, said heel and additional pressers being movable relatively to the remainder of the press and to one another, and means coupling said heel and additional pressers together so that when either of them is moved said means constrains the other to move oppositely and to a proportionate extent.

4. A press for clamping a shoe supported on a collapsible last consisting of a toe component, a heel component and a pivotal connection between said components, said press comprising a yoke, a toe presser to apply pressure to said toe component, a heel presser to apply pressure to said heel component, said toe and heel pressers being mounted on said yoke at locations spaced apart, an additional presser mounted at an intermediate location on said yoke to apply pressure to said pivotal connection, and means mounted on said yoke and coupling one of said toe and heel pressers to said additional presser in order to maintain a predetermined proportionality between pressures applied by said one presser and said additional presser.

5. A press according to claim 4 in which said means for maintaining proportionality of pressure comprise a member turnably mounted on said yoke and engaging on the one hand with said one presser and on the other hand with said additional presser so that if either of such pressers is forced up the other is forced proportionately down, and spring means opposing motion of one of said two last-mentioned pressers.

6. A press for clamping a shoe supported on a collapsible last consisting of a toe component, a heel component and a pivotal connection between said components, said press comprising a yoke, a toe presser on said yoke to apply pressure to said toe component, a heel presser on said yoke to apply pressure to said heel component, an additional presser on said yoke to apply pressure to said pivotal connection, and means for maintaining proportionality of pressure between one of the toe and heel pressers and said additional presser comprising a coupler toothed at opposite sides and journalled on said yoke, teeth on said one of the toe and heel pressers meshing with the teeth at one side of said coupler, teeth on said additional presser meshing with the teeth at the opposite side of said coupler, and spring means opposing motion of one of said two last-mentioned pressers.

7. A press for clamping a shoe supported on a collapsible last consisting of a toe component, a heel component and means connecting said components together, said press comprising a base, a depressible yoke, a pivotal attachment between said yoke and said base, a toe presser on said yoke to apply pressure to said toe component, a heel presser on said yoke to apply pressure to said heel component, an additional presser on said yoke to apply pressure to said connecting means, and an abutment on said yoke for receiving power-produced pressure to turn said

yoke about said pivotal attachment in order to depress said yoke towards said base.

8. A press for clamping a shoe supported on a collpasible last consisting of a toe component, a heel component and means connecting said components together, said press comprising a base, a depressible yoke, a pivotal attachment between said yoke and said base, a toe presser on said yoke to apply pressure to said toe component, a heel presser on said yoke to apply pressure to said heel component, an additional presser on said yoke to apply pressure to said connecting means, and a retractable toothed detent on said base for locking said yoke when depressed.

9. A press for clamping a shoe supported by a last and comprising a base whereon the last-supported shoe is seated, a yoke pivotally connected to said base, interacting members on said base and yoke for locking said yoke in a depressed position, a toe presser and a heel presser mounted at spaced locations on said yoke and arranged to apply pressure when the yoke is depressed to the heel and toe respectively of said last, and an additional presser mounted on said yoke intermediate said toe and heel pressers and adapted to apply pressure to said last at a place between the heel and toe.

10. A press for clamping a shoe supported by a last and comprising a base whereon the last-supported shoe is seated, a yoke pivotally connected to said base, interacting members on said base and yoke for locking said yoke in a depressed position, a toe presser and a heel presser mounted at spaced locations on said yoke and arranged to apply pressure when the yoke is depressed to the heel and toe respectively of said last, an additional presser mounted on said yoke intermediate said toe and heel pressers and adapted to apply pressure to said last at a place between the heel and toe, and means mounted on said yoke and coupling one of said toe and heel pressers to said additional presser in order to maintain a predetermined proportionality between pressures applied by said one presser and said additional presser.

11. A press according to claim 10 in which said means for maintaining proportionality of pressure comprise a member turnably mounted on said yoke and engaging on the one hand with said one presser and on the other hand with said additional presser so that if either of such pressers is forced up the other is forced proportionately down, and spring means opposing motion of one of said two last-mentioned pressers.

12. A press for clamping a shoe supported by a last and comprising a base whereon the last-supported shoe is seated, a yoke pivotally connected to said base, interacting members on said base and yoke for locking said yoke in a depressed position, a toe presser and a heel presser mounted at spaced locations on said yoke and arranged to apply pressure when the yoke is depressed to the heel and toe respectively of said last, an additional presser mounted on said yoke intermediate said toe and heel pressers and adapted to apply pressure to said last at a place between the heel and toe, and means for maintaining proportionality of pressure between one of the toe and heel pressers and said additional presser comprising a coupler toothed at opposite sides and journalled on said yoke, teeth on said one of the toe and heel pressers meshing with the teeth at one side of said coupler, teeth on said additional presser meshing with the teeth at the opposite side of said coupler, and spring means opposing motion of one of said two last-mentioned pressers.

13. A press as claimed in claim 12 in which said coupler meshes with the additional presser and with the heel presser.

14. A press for clamping a shoe supported on a collapsible last consisting of a toe component, a heel component and means connecting said components together, said press comprising a base, a depressible yoke, a pivotal attachment between said yoke and said base, a toe presser on said yoke to apply pressure to said toe component, a heel presser on said yoke to apply pressure to said heel component, an additional presser on said yoke to apply pressure to said connecting means, a retractable toothed detent on said base for locking said yoke when depressed, an inflatable and deflatable seat on said base for said last-supported shoe, and spring means for returning said yoke from its depressed position on retraction of said detent.

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