June 18, 1957 R. HARVEY 2,795,850

PRESS FOR AMALGAMS AND THE LIKE

Filed April 25, 1956

Fig. 1.

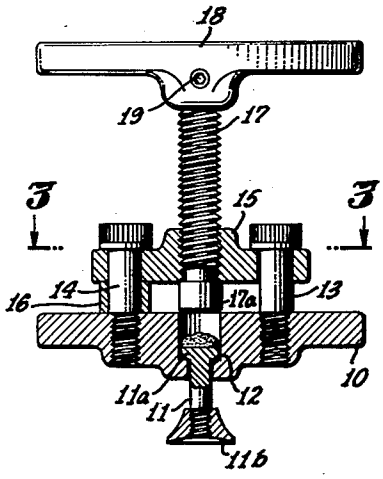


Fig. 2.

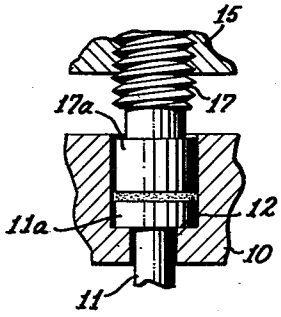


Fig. 3.

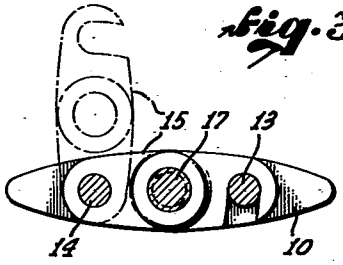
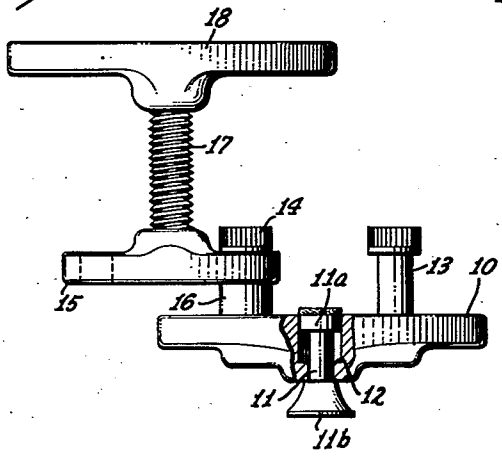


Fig. 4.



RICHARD HARVEY,
INVENTOR.
SMYTH & ROSTON,
ATTORNEYS.
BY George J. Smyth

United States Patent Office

2,795,850

Patented June 18, 1957

2,795,850

PRESS FOR AMALGAMS AND THE LIKE

Richard Harvey, Gardena, Calif.

Application April 25, 1956, Serial No. 580,511

9 Claims. (Cl. 32—40)

The present invention relates to miniature presses or clamping devices; and it relates more particularly to an improved press for removing excess liquid from a substance, for example, for removing excess mercury from an amalgam of mercury and silver.

Amalgams of mercury and silver have long been used in the dental profession for filling cavities in teeth. Some difficulties have been encountered in the past in providing amalgams for this purpose that have the proper proportion of silver and mercury. If the amalgam is too "wet" due to an excess of mercury, it will not set properly in the tooth. On the other hand, if the amalgam is too "dry" due to insufficient mercury, it is difficult to work with and does not have the desired adhesive properties. It is essential, therefore, for dental purposes that the amalgam have just the right consistency. It has been usual in the past to form an amalgam by mixing an excess of mercury with the silver and then squeezing the wet amalgam in a filter (such as a porous cloth) to remove the excess mercury, and to attempt thereby to obtain the desired consistency of the amalgam. Such prior art methods, for the most part, are awkward and difficult to carry out and usually do not result in obtaining an amalgam of the desired composition.

An important object of the present invention is to provide an improved device that is eminently suited for removing excess mercury in the preparation of amalgams for dental purposes; which device is simple in its construction and easy to operate, and which device may be easily cleaned and is well suited for sterilization.

Another object of the invention is to provide an improved device of the type described in the preceding paragraph which may be constructed at a relatively low cost and sold at a relatively low price.

The various features and advantages of the present invention may be understood from the following detailed description considered with the accompanying drawing.

In the drawing, which is to be regarded as merely illustrative:

Figure 1 is a full-scale representation, partly in section, of one embodiment of the improved device of the present invention, and this figure shows the device in elevation and in a closed position with a charge incorporated therein ready to have a pressing or squeezing operation performed thereon;

Figure 2 is an enlarged fragmentary view of the device, partly in section, showing a piston element screwed down into pressing relation with the charge to remove excess liquid therefrom;

Figure 3 is a view taken along the line 3—3 of Figure 1 and illustrates a pivoted bracket component of the device; and

Figure 4 is an elevational full-scale view of the device, partly in section, showing the device in an open position at the termination of a pressing operation.

The invention provides a press for removing excess liquid from a substance to be treated, such as from an amalgam of mercury and silver. The press comprises

a base member having an aperture extending therethrough and with the aperture having a shoulder formed therein. A pedestal is positioned in the aperture for reciprocal motion therein, and the pedestal is in loose fit in the aperture to permit excess liquid from the substance to be treated to pass through the aperture. The pedestal has an upper platform of increased radius and which is adapted to seat on the shoulder when the pedestal is in its lowermost position, thereby to limit the downward motion of the pedestal. The pedestal also has a lower member of increased radius for limiting the upward motion of the pedestal, this limitation occurring when the top surface of the platform of the pedestal is flush with the upper surface of the base.

A pair of posts are mounted on the top surface of the base on opposite sides of the aperture therein, and a bracket is pivoted to one of the posts for pivotal motion in a plane spaced from and parallel to the upper surface of the base. The bracket has a hooked free end which engages the other post as the bracket is swung from an open to a closed position, and this limits rotation of the bracket. A piston is threaded through an aperture in the bracket, and this piston extends perpendicular to the upper surface of the base. The piston is brought into alignment with the aperture in the base by pivoting the bracket to its closed position so that the piston may enter the aperture in the base to approach the top of the platform of the pedestal.

The substance to be treated is placed in the aperture in the base on the top of the platform portion of the pedestal, and the bracket is pivoted to its closed position bringing the piston into alignment with the aperture. The piston is manually rotated so that its lower end enters the aperture in the base and presses against the substance on the platform so as to remove excess liquid therefrom. This excess liquid flows down through the aperture between the pedestal and the walls of the aperture. The device is designed so that the threads on the piston are relatively coarse and, after some experience with the device, it is possible to determine manually by the "feel" of the piston as it is rotated that a desired consistency of the substance to be pressed has been reached. When such a consistency has been reached, the piston is rotated in the opposite direction to remove its bottom portion from the aperture in the base, and the bracket is pivoted to its open position to move the piston away from the aperture. The pedestal is then moved to its upper position so as to bring the pressed substance up out of the aperture to the top surface of the base. This enables the substance conveniently to be removed from the press for subsequent use.

Referring now to the drawing, it will be noted that the illustrated device is a small manually-operated press. The press includes a base member **10** having, for example, an elliptical shape (Figure 3) and composed, for example, of stainless steel. The base **10** has an aperture extending therethrough, and a pedestal **11** is positioned within the aperture for reciprocal motion therein. The pedestal is in loose fit with the aperture to permit liquid that is squeezed from the substance treated by the press to pass down through the aperture between the pedestal and the wall of the aperture.

The pedestal **11** may also be composed of stainless steel, and it has an integral top portion **11***a* which is flared radially outward to form a platform and which seats on a shoulder **12** formed in the aperture. The pedestal **11** has a lower portion **11***b* which is flared radially outward to limit the upward motion of the pedestal in the aperture. The lower portion **11***b* may be a nut in the form of a truncated cone threaded to the central shank of the pedestal as shown, for example, in Figure 1.

Pedestal **11**, therefore, is constrained to move up and down within the aperture in base **10** between an upper and a lower position, this motion being limited in the lower position of the pedestal by the seating of platform **11***a* on the shoulder **12**, and the motion being limited in the upper position of the pedestal by the engagement of the nut **11***b* with the lower surface of base **10**. The nut **11***b* is preferably adjusted on the shank of the pedestal so that the top of the platform **11***a* is flush with the upper surface of base **10** when the pedestal is in its upper position.

A pair of posts **13** and **14** are mounted on the upper surface of base **10**, and these posts may take the form of stainless steel screws threaded into the base. A bracket **15**, which also may be composed of stainless steel, is pivoted at one of its ends to the post **14**, and this bracket is spaced from the upper surface of base **10** by a spacer **16** coaxially mounted on post **14**. The bracket is held against axial motion on the post **14** by the head of that post and by the spacer, and the bracket may be pivoted about the post in a plane spaced from and parallel to the top surface of the base **10**.

The other end of bracket **15** has a hooked shape (as clearly shown in Figure 3) and this hooked end embraces the post **13** when the bracket is pivoted about post **14** from its open position to its closed position. The bracket has a central aperture therein which is brought into axial alignment with the aperture in base **10** when the bracket is pivoted to its closed position.

A piston **17**, which may be formed of stainless steel, is threaded through the aperture in bracket **15**, with the piston extending along an axis perpendicular to the top of base **10**. The piston has a lower end portion **17***a* which, when the bracket **15** is in its closed position, is adapted to enter the aperture in base **10** and approach the top of the platform **11***a* of pedestal **11**.

Piston **17** has an elongated radial handle secured to the top end thereof by means, for example, of a set screw **19**, and the handle is supported on the piston at its midpoint. The handle, also, may be composed of stainless steel.

An amalgam consisting, for example, of silver and an excess of mercury may be placed on the top of the platform **11***a* in the cavity formed in the base **10** by the aperture therein and the top of the platform when the pedestal **11** is in its lowermost position. The bracket **15** is then pivoted to its closed position, as shown in Figure 1. Handle **18** is then manually actuated to rotate piston **17** and bring its end portion **17***a* down into the cavity; and as shown in Figure 2, into pressing and squeezing engagement with the substance on the platform **11***a*.

It might be noted that when the end **17***a* of the piston enters the aperture in base **10**, bracket **15** is held in its closed position by the piston. This adds to the simplicity of the device, since it allows bracket **15** to be freely rotatable on post **14** from its open to its closed position, and requires no further means for retaining the bracket in its closed position when the press is in operation.

The operator continues to rotate handle **18** until the excess mercury has been squeezed out of the amalgam and through the aperture in the base between the pedestal and the wall of the aperture. It should be noted that the "loose fit" of pedestal **11** and platform **11***a* in base **10** has been exaggerated in the drawings for purposes of clarity, and the clearance of the pedestal with the base is usually only of the order of 2–3 thousandths of an inch as any excessive clearance will allow the amalgam to enter and clog the aperture in the base. It should also be noted that the excess mercury not only passes through the aperture in the base, but usually also passes upwardly around portion **17***a* of piston **17**. This portion **17***a* also may have a clearance of the order of 2–3 thousandths of an inch which also has been exaggerated in the drawing.

After some experience with the device, the operator can determine by the "feel" or resistance of piston **17** to

rotation that the desired consistency of the amalgam has been reached. This is assisted by making the threads of piston **17** somewhat coarse, for example, of the order of 18–24 to the inch; and by making the handle sufficiently short that it does not exert excessive leverage. It has been found that fewer threads to the inch than the range stated above make it difficult to exert sufficient force in the device to perform its pressing function; whereas more threads to the inch makes the operation unduly slow and makes it difficult to tell when the desired consistency has been reached. For example, the handle may have an overall length of the order of 2½ inches. Of course, these dimensions are merely by way of example and are not intended to limit the invention in any way.

After the desired consistency of the amalgam has been obtained, the piston is rotated in the opposite direction to remove its end portion **17***a* from the aperture in base **10**. Bracket **14** can then be swung to its open position, as shown in Figure 4. The pedestal **11** can then be raised to its uppermost position so that the top of platform **11***a* is flush with the top surface of base **10** to facilitate the removal of the treated amalgam.

The invention provides, therefore, a relatively simple instrumentality that can be conveniently operated to remove excess liquid from an amalgam or any other substance. The device is simple in its construction, it uses relatively few readily available components, and it can be sold at a relatively low cost. Moreover, the device is extremely easy to clean and sterilize.

My description in specific detail of selected embodiments of the invention will suggest to those skilled in the art, various changes, substitutions and other departures from my disclosure that properly lie within the spirit and scope of the appended claims.

I claim:

1. A press for removing excess mercury from an amalgam of mercury and silver including in combination: a base member having an aperture extending therethrough and with said aperture having a shoulder formed therein; a pedestal positioned for reciprocal movement in said aperture and in loose fit therein to permit excess mercury from an amalgam in the press to pass through the aperture between the pedestal and the base, said pedestal having an upper portion flared radially outward and adapted to seat on said shoulder and having a lower portion flared radially outward and adapted to limit upward movement of said pedestal at a point where said upper portion thereof is substantially flush with the upper surface of said base member; a pair of posts mounted on the upper surface of said base member on opposite sides of said aperture and extending outwardly therefrom; a bracket member having one end pivoted to one of said posts and having a hooked-shaped configuration at its other end, said bracket being movable in a plane spaced from and parallel to the upper surface of said base between an open position and a closed position, in which closed position the hooked-shaped end of said bracket embraces the other of said posts, said bracket having a central aperture therein adapted to be axially aligned with said aperture in said base when said bracket is in said closed position; a piston threaded into said aperture in said bracket for entry into said aperture in said base when said bracket is in said closed position; and a radial handle mounted at the end of said piston remote from said base.

2. A press for removing excess liquid from a substance to be treated including in combination: a base member having an aperture extending therethrough and with said aperture having a shoulder formed therein; a pedestal positioned for reciprocal movement in said aperture and in a fit therein to permit excess fluid from a substance in the press to pass through the aperture between the pedestal and the base, said pedestal having an upper portion flared radially outwardly and adapted to seat on said shoulder; a pair of posts mounted on the top surface of

said base member on opposite sides of said aperture; a bracket member pivoted at one end to one of said posts and having a hooked configuration at its other end, said bracket being movable in a plane spaced from and parallel to said base between an open position and a closed position, in which closed position the hooked-shaped end of said bracket embraces the other of said posts; and a piston threaded into an aperture in said bracket and adapted to enter said aperture in said base when said bracket is in said closed position.

3. A press for removing excess liquid from a substance to be treated including in combination: a base member having an aperture extending therethrough; a pedestal positoned for limited reciprocal motion in said aperture; a bracket pivotally mounted on said base for swivable motion in a plane spaced from and parallel to said base; and a piston threaded into an aperture in said bracket and adapted to enter said aperture in said base and approach the top of said pedestal.

4. The press defined in claim 1 in which said piston has a number of threads formed on the outer surface thereof within the range of 18–24 per inch.

5. The press defined in claim 1 in which said radial handle is of the order of two and one-half inches long and is supported at its mid-point on said piston.

6. A device for removing excess liquid from a substance to be treated including in combination: a base member having an aperture extending therethrough; a sliding member positioned in said aperture and movable therein between a first position in which its upper surface is substantially flush with the top surface of said base and a second position in which its upper surface is arrested at a fixed position below the top surface of said base; a bracket pivotally mounted on said base spaced from and parallel to said top surface thereof; and a piston member threaded through said bracket and extending perpendicular to said top surface of said base, said piston member being aligned with said aperture in said base by said bracket and being adapted to enter said aperture in said base to approach the top of said pedestal; at least one of said members being in a selected fit in said aperture so as to provide a clearance such that excess fluid only from a substance in the press can pass through the aperture.

7. A device for removing excess liquid from a substance to be treated, including in combination: a base member forming a press chamber to receive said substance, said chamber having a drainage outlet for the excess liquid; a second chamber having a threaded bore; a piston member to retractably extend into said chamber, said piston member being manually rotatable and being threaded through said bore to compress said substance by screw action; means cooperative with said base member and said second member to releasably hold said second member in operating position with its threaded bore in alignment with said chamber; and a pedestal normally at the inner end of said chamber to support said substance in opposition to the pressure exerted by the piston member, said pedestal being movable to lift the pressed substance to the outer end of the chamber.

8. The press defined in claim 7 which includes means extending from the pedestal through said drainage outlet for manually moving the pedestal to lift the pressed substance.

9. A press for removing excess mercury from a silver amalgam for dental use, comprising: a base member having an aperture extending therethrough; a pedestal slidably mounted in said aperture for limited reciprocal movement between alternate positions in said aperture, the one face of said pedestal, in one of said alternate positions, forming with the walls of said aperture a chamber for receiving a mass of amalgam; a bracket mounted to said base member for movement into and out of a position overlying the aperture of said base member; a piston mounted to said bracket for coaxial movement and movable into said aperture when said bracket is moved to a position overlying said aperture; and means for forceably moving said piston into said aperture to compress said amalgam for removing excess mercury therefrom; movement of said pedestal to the other of said alternate positions, after said piston has been removed from said aperture, resulting in ejection of said amalgam from said chamber.

References Cited in the file of this patent

UNITED STATES PATENTS

2,299,265 Chott ..... Oct. 20, 1942