Nov. 17, 1925. 1,562,134

H. ZANDER

STRAINER FOR OIL PRESSES

Filed April 9, 1921 2 Sheets-Sheet 1

Fig. 1.

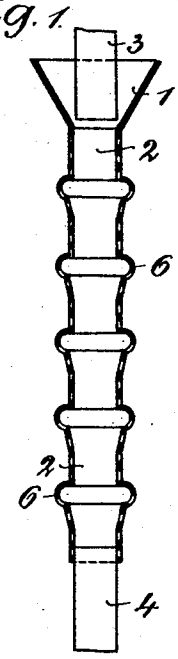

Fig. 2.

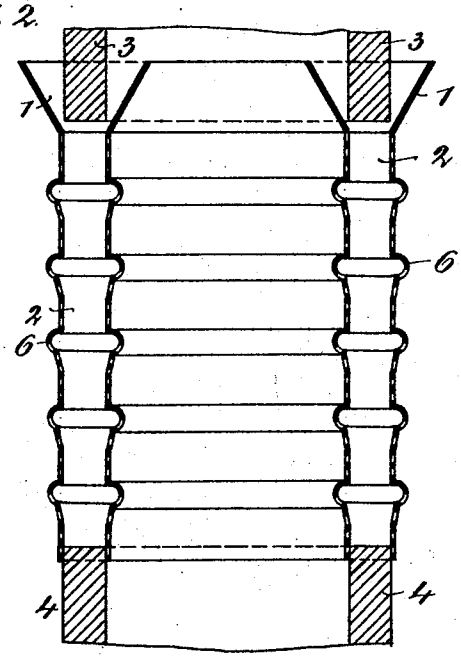

Fig. 3.

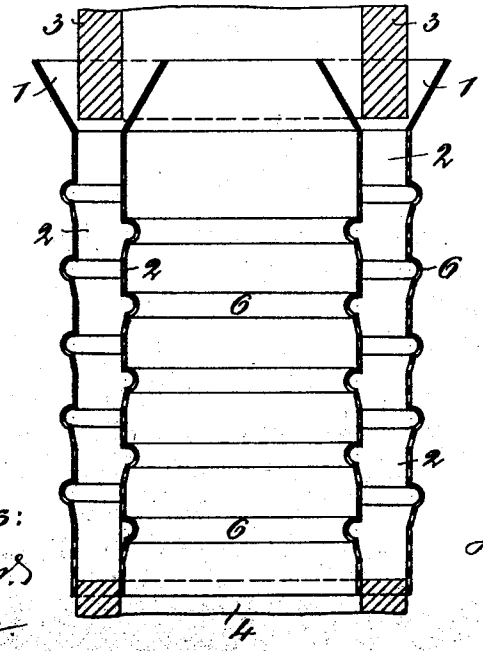

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Fig. 4.

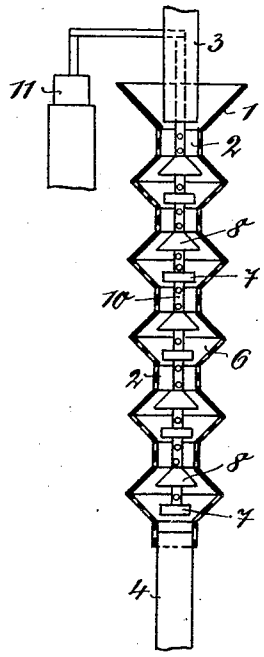
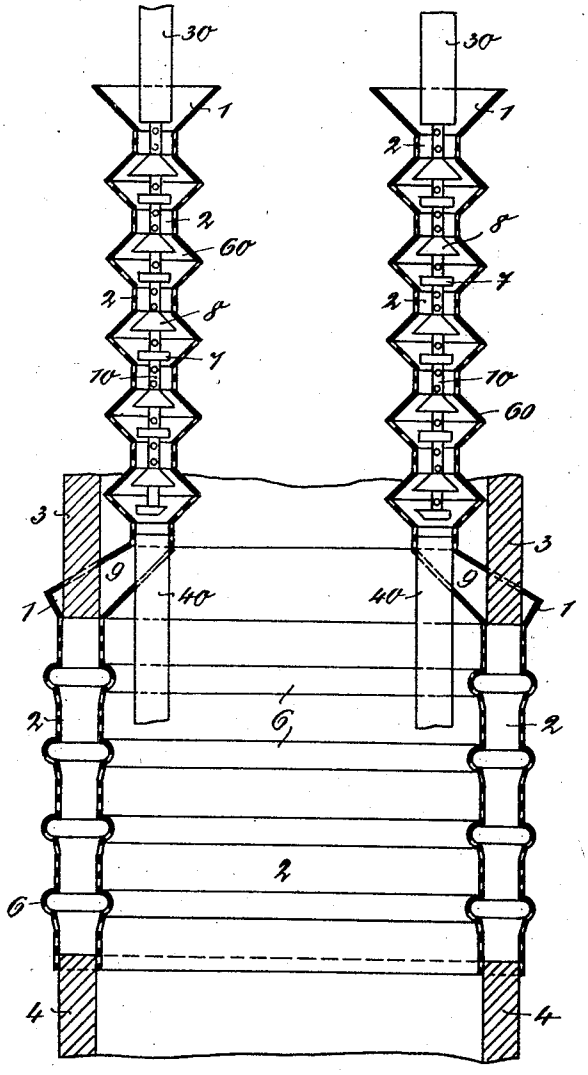


Fig. 5.



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UNITED STATES PATENT OFFICE.

HERMANN ZANDER, OF STETTIN, GERMANY.

STRAINER FOR OIL PRESSES.

Application filed April 9, 1921. Serial No. 460,067.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, HERMANN ZANDER, a citizen of the German Republic, residing at Stettin, Germany, have invented certain new and useful Improvements in Strainers for Oil Presses, of which the following is a specification.

The construction of automatically fed oil presses is very difficult and expensive as the height of the strainer must be very small due to loss of pressure owing to the friction upon the side walls of the material being pressed. The cross section of the strainer must be small in order to ensure a good flowing out of the oil; but the smaller this cross section is, the greater becomes the loss due to friction so that, for all these reasons, the selections of the vertical dimensions is greatly restricted.

According to this invention the strainer is subdivided in vertical direction, so that in the direction of pressure a number of small low strainers succeed between which points of interruption are arranged which serve as oil outlets. The height of the small individual strainers is very low and the loss from friction is not considerable.

In order that the invention may be clearly understood, I shall proceed to describe the same with reference to the form of construction diagrammatically shown by way of example in the accompanying drawings, wherein:—

Figure 1 represents a tubular strainer.

Figures 2 and 3 representing each an annular strainer.

Figures 1 to 3 show the first form of construction of the strainer.

Figure 4 shows a modified form of construction.

Figure 5 illustrates a form of construction in which the forms of construction shown by Figures 2 and 4 are combined.

With reference to Figures 1–3 the strainer is composed of superposed individual strainers 2 with inserted distance pieces 6, of the pistons 3 and 4 and of the funnel 1. The tubular strainer shown by Figure 1 works as follows:—

The lower piston 4 is first raised to the lower edge of the upper strainer ring 2, whereupon the piston 3 is operated manually or by any suitable means and presses material through the funnel 1 until the ring 2 is filled. The piston 3 is raised to permit introduction of fresh material, and when a predetermined pressure is reached the piston 4 is lowered by any suitable means to the lower edge of the next strainer ring 2 which allows the cake formed in the first strainer ring to descend into the next one.

In this strainer a determined quantity of material is thus preliminarily compressed and formed into a solid cake which is subsequently pushed through the strainer from top to bottom and is finally expelled from the bottom end.

With every new stroke of the pistons 3 and 4 fresh material is filled into the upper strainer 2 and compressed, the previously compressed cake descending into the next lower strainer. The cakes are continuously submitted to the pressure action, this pressure being however not used for varying the shape of the cake which has been formed in the upper strainer 2 but merely for squeezing out oil which does flow out through the perforated side walls of the strainers and through the distance pieces 6. With a view to facilitate the admission of the cakes from one strainer into the lower strainer when the shape of the cake should have been slightly altered, the strainers are flared at their upper ends.

When the cake first formed has reached the lower end of the tubular strainer it is expelled, the piston 4 descending at each stroke to permit the expulsion of a cake and returning to position in the bottom end of the tubular strainer to serve as a bottom or abutment to counteract the pressure of the piston 3.

If, instead of continuous pressing, the pressing has to be effected in batteries so that it lasts longer the working is interrupted when the first cake has reached the end of the strainer. The strainer is emptied by means of a simple pushing piston or at the next charge in the manner described in connection with the continuous working. The old cake serves now as resistance. An oil press of this construction can therefore be used either as automatic press or as filling and emptying press for the batteries, provided that the strainer be movable.

The annular or ring press shown in Figure 2 will be easily understood from the description as above. In the ring press

shown in Figure 3 the distance pieces 6 between the walls of the strainers are not situated in the same plane as shown by Figures 1 and 2 but those of the inner cylinders are displaced with regard to those of the outer cylinders.

Figure 4 shows a form of construction according to which the entire strainer column is composed of individual strainers with interposed distance pieces, auxiliary devices for completing the pressing action of the pistons 3 and 4 being provided.

The strainer is composed of the individual strainers 2 and of the distance pieces 6 which form enlargements. A vertical rod 10 traversing the strainer column has small pistons 7, one for each individual strainer, which fit into said strainers. Conical strippers 8 are arranged above said pistons 7. The rod 10 is adapted to execute a reciprocating movement, a separate drive, e. g., a piston 11, being provided for this purpose. The rod 10 could also be connected with the main pressure piston 3. The rod 10 is perforated so that the outflow of the oil is facilitated. The material to be pressed drops from the funnel 1 into the strainer being pushed in by the piston 3. When the press is being charged the pistons 7 are situated in the enlarged distance pieces 6 (Fig. 4) so that the material can get around the pistons 7 and around the strippers 8.

As the material to be pressed consists of oil containing substances it does not fill the strainer automatically but has to be pushed down by the reciprocating motion of the rod 10 with the pistons 7 and strippers 8, the material being thus preliminarily pressed. When the strainer is filled the pressing proper begins as the pistons 7 are moved by the rod 10 from the enlarged distance pieces 6 into the corresponding strainers 2. When the pistons get into these narrow strainers they find an increased resistance, which results on the one hand from the filling of the strainers and on the other hand from the pressure exerted by the pistons 3 and 4, the pressure acting much stronger in the narrow strainers than in the enlarged distance pieces 6.

When a determined pressure has been reached in the strainer, the piston 4 is lowered manually or by any suitable means known in the art and part of the lowest cake will be expelled as the lowest small piston 7 descends down to half the height of the lowest strainer 2. Some space will thus get free in the lowest enlarged distance piece 6 into which some cake is pushed from the next higher strainer 2. This continues up to the extreme upper strainer. The piston 3 is now raised to admit fresh material into the strainer and the rod 10 with the pistons is thereby drawn along by piston 3 so that these pistons are situated again in the enlarged distance pieces 6. During this movement the sharp upper ends of the pistons 7 and the strippers 8 will loosen the material in the enlarged distance pieces 6 so that it can be drawn along by the pistons 7 at the succeeding down stroke of pistons 3 and the descending movement of rod 10 resulting herefrom, said material being thus squeezed into the narrow strainers 2. The cake which is in the strainers offers resistance so that the material which has just been fed into the strainers is compressed.

The strokes of the rod 10 and of the pistons 7 are short. They are determined first by the position of the pistons 7 in the enlarged distance pieces 6 during the charging operation, secondly by the position of the pistons at each pressing, thirdly by the position of the pistons at the idle stroke as in this case the pistons go down to the lower edge of the narrow strainers 2 to expel the whole cake.

By the form of construction shown by Fig. 5 a combination of the forms of construction according to Figures 2 and 4 is illustrated. Below tubular strainers constructed as described with reference to Fig. 4 a ring strainer with annular pistons 3 and 4 is arranged. The tubular strainers have pressing pistons 30 and 40. The upper annular piston 3 for the ring strainers surrounds the tubular strainers. The ring strainer has distance pieces 6, the tubular strainers have enlargements 60 between the narrow strainers 2. Conduits 9 serve for connecting the outlets of the tubular strainers with the funnels 1 of the ring strainer. The lowest pistons 7 upon the rods 10 correspond in shape with the conduits 9. This arrangement presents the advantage that two different pressures can be applied successively.

It may be remarked that progressing variations of pressure can be produced in the strainer shown by Fig. 4 by reducing the diameters of the narrow strainers 2 and consequently of the corresponding pistons 7 from the lower end strainer to the upper end strainer.

I claim:—

1. An improved strainer for oilpresses comprising a number of superposed individual strainers of low height offering little resistance from friction and distance pieces separating the superposed strainers.

2. An improved strainer for oilpresses comprising a number of superposed individual strainers of low height offering little resistance from friction, distance pieces separating the superposed strainers, a reciprocating rod axially arranged in said strainer and pistons upon said rod one for each individual strainer.

3. An improved strainer for oilpresses comprising a number of superposed individual strainers of low height offering little

resistance from friction, distance pieces separating the superposed strainers, a reciprocating rod axially arranged in said strainer, pistons upon said rod one for each individual strainer and a stripper over each of said pistons on the rod.

4. An improved strainer for oilpresses comprising in combination a number of superposed ring-shaped strainers, distance pieces between said individual ring shaped strainers, a pressure piston at the upper end of the column of ring-shaped strainers and a counter pressure piston at the lower end of said column, columns of tubular strainers comprising enlarged distance pieces between the individual narrow strainers and means for alternately loosening and compressing the material to be compressed, said tubular columns being arranged above said ring shaped strainer column and conduits connecting the outlets of said tubular strainer column with the inlets of said ring-shaped strainer column, substantially as described and shown and for the purpose set forth.

In testimony whereof I affix my signature.

HERMANN ZANDER.