United States Patent

Kiebach

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[54] ASSEMBLY ELEMENT FOR PRESS

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[52] **U.S. Cl.** **210/380,** 210/488, 210/499

[51] **Int. Cl.** **B01d 33/02**

[58] **Field of Search**.....210/380, 381, 488, 497, 498, 210/360 A, 499; 55/278

[56] **References Cited**

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[57] **ABSTRACT**

For use in assembling the housing of a press wherein the slot between adjacent elements is subjected to substantial wear and yet must maintain controlled spacing to obtain the desired product separation, an element which in multiple installations forms the housing wherein each element preferably comprises elongate bar stock material having integrally formed spacers of one face thereof so that a plurality of said elements forms the housing and provides the appropriate width slots therebetween, and wherein the bar stock and integral spacers are formed with a step or plateau of uniform thickness which is adapted to be worn away during conventional use of the press housing, and the slots between adjacent bars remain a consistent width.

10 Claims, 4 Drawing Figures

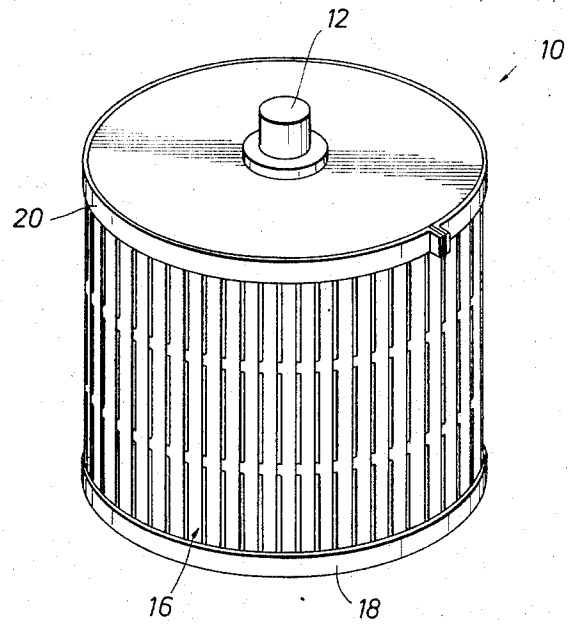


FIG. 1

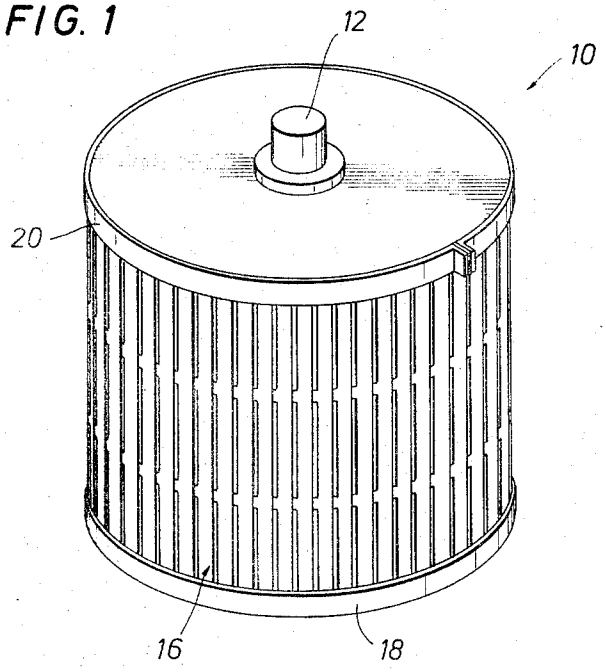


FIG. 2

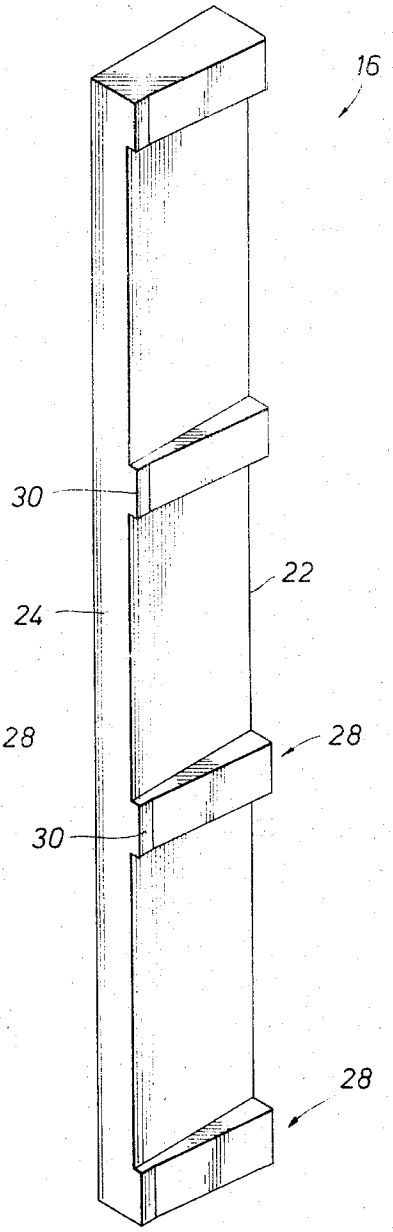


FIG. 3

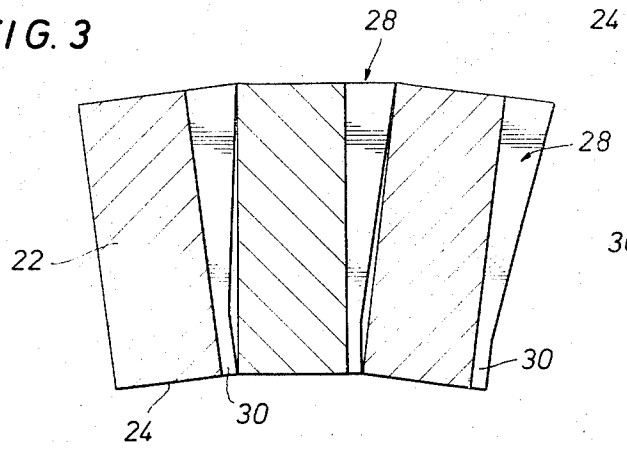
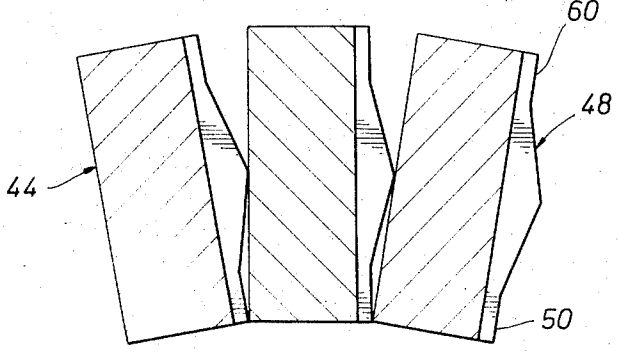


FIG. 4



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ASSEMBLY ELEMENT FOR PRESS

SUMMARY OF PROBLEM AND SOLUTION

In the handling of abrasive slurrys under high pressure in a press, a means of separating components of the slurry has been devised heretofore which involves the use of bar stock to fabricate the housing of the press with slots of controlled width between adjacent bar-like members. This has been found quite adequate in times past. However, the abrasive nature of the slurry materials and various components thereof tends to wear on the bar stock. In the devices of the prior art, the width of the slot is customarily controlled by spacers between adjacent bars. In effect, shim stock between adjacent bars controls the width of the slot and the ever increasing width of the opening behind the slot. This provides a suitable passage for draining of the slurry components.

As pressures and flow volumes increase, the abrasive nature of the slurry material has become so severe that wearing of the bar stock components of the housing or cage has become quite critical. As a consequence, the bar stock wears away, and as the face toward the slurry material wears, the slots between adjacent bar members become too wide. When this happens, the press looses efficiency, and the quality of separation is severely degraded. It will be appreciated and understood that for a given range of slurry concentrations, pressures, flow volumes, and variations in abrasive characteristics, that a preferred range of slot width exists. Once the width becomes excessive, the press no longer functions in the desired manner. Therefore, steps have been taken to prolong the life of the bar stock comprising the cage or housing, but without much success.

The present invention solves the above problem, and several others. In the main, the device of the present invention relates to an individual bar stock or element which is repetetively used in assembling the cage or housing of the press. Preferably, it incorporates a bar of rectangular cross section along its full length. A narrow face is presented toward the press proper. An integrally formed spacer is included at several points along the length of the bar stock. The integrally formed spacer means is preferably wedge shaped inasmuch as adjacent elements of the assembled housing inscribe a slight angle between one another. The spacer means, at their narrow end, extend from the face of the bar stock to provide an elongate slot when adjacent elements are assembled. Preferably, the spacer means are wedge-shaped, except that the narrow end includes a step. The step is adjacent the face of the bar stock which is worn away during its use in the press. As the bar stock and spacer both wear away, the slot remains essentially a constant width, and the problems previously noted are avoided.

Many objects and advantages of the present invention will become more readily apparent from a consideration of the following specification and drawings, which are:

FIG. 1 is a perspective view of a press housing formed of the elements of the present invention;

FIG. 2 is an isometric view of a single element illustrating the wedge-shaped spacer means having a slight step at the narrow end;

FIG. 3 is a sectional view through three adjacent elements showing the close relationship between elements for maintaining a slot therebetween of controlled width, notwithstanding any wear; and,

FIG. 4 is a sectional view similar to FIG. 3 illustrating an alternative embodiment to the present invention

In the drawings, attention is first directed to FIG. 1 which illustrates a press indicated generally by the numeral 10. A shaft suitable for rotation by a prime mover, not shown, is indicated at 12, and suitable rotative apparatus is found within the housing. The nature of the press is beyond the scope of the present disclosure, and is of no particular concern hereto. The present invention is directed to the cage or housing formed of individual elements about the press, and hence, the prime mover, points of ingress and egress, and the like, are of no particular concern. The structure of FIG. 1 includes a number of elongate bar-like members which are generally indicated by the numeral 16 as comprising an encircling cage or housing for the press. The bar members are individually held in position and nested, one against the other, by means of certain tension straps or bands as indicated at 18 and 20. Once the bars are placed in position, the straps 18 and 20 secure them snugly against one another and provide definite form and shape to the encircling housing.

While the foregoing describes the circumstances of the use of the present invention, attention is next directed to FIG. 2 for a specific detailed description of the apparatus of the present invention.

In FIG. 2, the numeral 16 indicates the element comprising the cage or housing of the press. The bar stock is indicated by the numeral 22 and has a length sufficient to define the housing of the press 10. The bar stock member 22 is provided with a face 24 which is a relatively narrow dimension, and which is fronted toward the abrasive slurry within the press 10. It will be understood that the face 24 wears away because of the abrasive nature of the slurry and the apparatus. The bar stock is relatively deep to provide adequate reenforcing behind the face 24.

The bar stock shown in FIG. 2 includes integrally formed spacer means as indicated by the numerals 28. The spacer means 28 are each preferably wedge-shaped with the narrow end of the wedge pointing toward the face 24 and a small step included at 30. The small step 30 found at the face end 24 of the bar stock is better illustrated in the sectional view of FIG. 3. In FIG. 3, the wedges 28 are shown sloping toward a relatively narrow point, but widening into the step of uniform thickness or width as shown in the drawings. By way of example, and not limitation, if the bar stock 22 is an inch in thickness, the step 30 might approximate almost a quarter inch in its greater dimension, and will stand above the surface of the bar stock 22 approximately two-sixteenths to four-sixteenths inches, depending on the width of the slot desired. Thus, for instance, if a slot three-sixteenths inch in width is desired, the step 30 will protrude three-sixteenths of an inch from the main body portion of the elongate bar stock 22.

As viewed in FIG. 3, it will be noted that the wedge 28 smoothly joins with the step 30 except for the point of deflection at the joinder. The step 30 protrudes sufficiently across its width and at the several locations

along the length of the bar stock **22** to attain the spacing desired in the assembly of the cage or housing for the centrifuge.

A close examination of FIG. **3** of the drawings illustrates the advantage of the present invention. Assume the face **24** of the several elements comprising the cage or housing wears thereacross and perhaps around the square corners at the slot **30**. As viewed in FIG. **3**, the wearing of the face **24** of the several elements comprising the cage or housing does not particularly widen the slot or opening between the adjacent members of the cage. Thus, if the members wear even to the extent of ten percent of their depth, the slot remains essentially of constant width. This materially prolongs the life of the apparatus before the time of replacement of the several bar elements comprising the cage or housing.

As viewed in FIG. **3**, it will be noted that wear across the face **24**, however irregular, must penetrate a very substantial portion of the element before the slots actually open up in width. This increases the service life for the reasons noted hereinabove.

Attention is next directed to FIG. **4** of the drawings which shows an alternative embodiment indicated by the numeral **44**. In the embodiment **44**, the spacer means **48** is altered to provide a reversable element for assembly of the housing of the press **10**. As shown in FIG. **4**, the assembly elements cooperate in the same manner as those in FIG. **3**. However, the spacer means on each element is altered so that both ends of the spacer means function in the described manner. By way of example, the numeral **50** indicates the step on the spacer means of FIG. **4** which is quite similar to the step **30** shown in FIG. **3**. Additionally, the numeral **60** indicates a second step formed at the opposite end of the spacer means **48**. It will be noted that the spacer means **48** slopes to a point from each of the steps **50** and **60**. Depending on the inclination of individual elements, first one step determines the slot or spacing and then the second, or remaining step, determines the spacing.

Through the use of the foregoing described spacer means, the individual elements may be reversed to obtain approximately twice the life of each element.

The foregoing has been directed to the embodiment of FIG. **4**. It will be understood and appreciated that other changes and variations in the configuration of the step and spacer means may be utilized in lieu of the embodiments shown. For example, the bar stock shown in FIGS. **3** and **4** is rectangular in cross section along the greater portion of its length, and excluding the spacer means. The side faces of the bar stock may be made concave while the spacer means extend only a nominal height above the outline of the rectangular bar stock. By this technique, the slots still remain uniform in width even after a substantial amount of wear has occurred. The several embodiments noted herein may be readily implemented in a variety of sizes, dependent on the requirements of the centrifuge **10**.

The terminology adapted in the foregoing is applied to the claims which are appended hereto.

What is claimed is:

1. A separator press comprising a cage assembled of a plurality of similar elongate bars having a first face, a second face at an angle with respect to said first face, and spacer means extending from said second face such that said means positions an adjacent elongate bar a selected distance therefrom and at an angle such that adjacent bars cooperate to form a circular cage, means for shaping said cage in a generally circular cage, the improvement comprising spacer means extending along said second face and having two portions, the first thereof extending toward said first face and being of generally uniform thickness and having a predetermined width, and the second portion being tapered to a second thickness greater than that of the first portion to aid in the assembly of said circular cage, said spacer means defining a slot between adjacent bars with the width of the slot being determined by said first portion of said spacer means whereby the slot remains a constant width as determined by the first portion of said spacer means.

2. The structure of claim **1** wherein said spacer means includes a third portion similar to the first portion in the size and shape, and a fourth portion which slopes from the second thickness.

3. The invention of claim **1** wherein said bar includes at least two spacer means along its length.

4. The invention of claim **1** further including generally perpendicular end faces on both ends of said bars.

5. The invention of claim **1** wherein said bars have a rectangular cross section at points other than said spacer means.

6. The invention of claim **1** wherein said bar has spacer means at each end thereof.

7. The invention of claim **1** wherein said spacer means is tapered and has a wider end and a more narrow end, said narrow end having a finite thickness, and extending toward the first face and protruding such that the first face is spaced from an adjacent and similar apparatus.

8. The invention of claim **1** including a wedge-shaped spacer means terminating in a step portion of essentially consistent thickness and having an outer face approximately parallel to the second face above which said spacer means extends.

9. The invention of claim **1** wherein said spacer means includes a step of generally uniform thickness adjacent to said first face, a sloping protruding portion of greater thickness extending across said second face from said step to a point of maximum elevation and an additional step at the far back end of said spacer means of similar size and shape to said first step, and a second sloping portion between said second step and said first sloping portion.

10. The invention of claim **1** including a perpendicular angle between said first and second faces.

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