Nov. 23, 1965 M. E. GINAVEN 3,218,964

CAGE BAR

Filed Jan. 24, 1963

Fig. 1

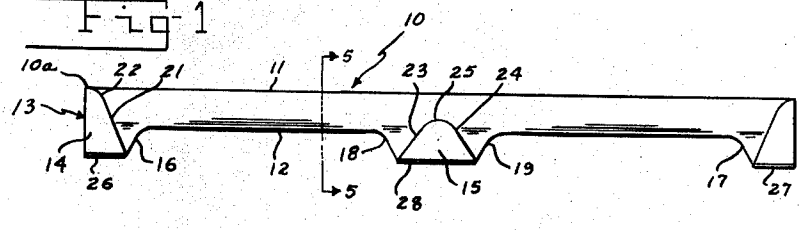


Fig. 2

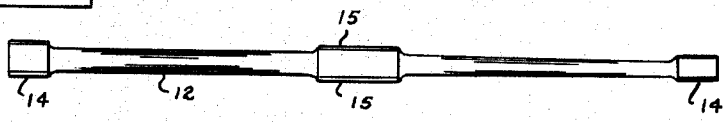


Fig. 3

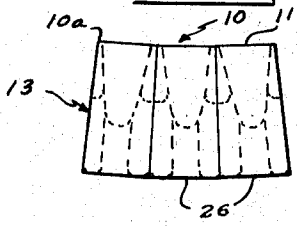


Fig. 4

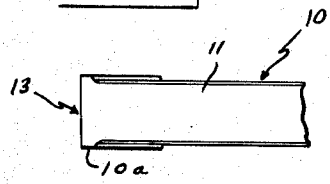
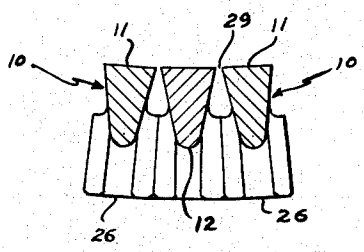


Fig. 5



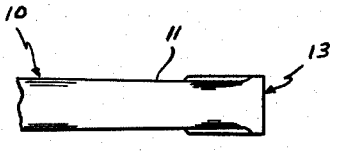


Fig. 6

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CAGE BAR

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5 Claims. (Cl. 100—129)

This invention relates to screen bars useful in press cages and the like, and particularly to a generally new bar cooperative with like elements to define a new cage structure.

Press cages of the kind with which this invention is concerned provide spaced apart elongate screen bars which contain the solid material under treatment while allowing expressed fluids to drain therefrom. Problems attendant upon the use thereof may result from clogging of the drainage slots and from use of separable spacers to maintain the predetermined bar separation.

The object of the invention is to simplify the construction as well as the means and mode of operation of cage bars, whereby such bars may not only be economically manufactured, but will be more efficient and satisfactory in use, adaptable to a wide variety of application, and be unlikely to get out of order.

Another object of the invention is to eliminate the use of screen bar spacers whereby to reduce assembly time and provide a stronger, safer to operate, screen structure.

A further object of the invention is to provide for increased flow area as well as for increased cleanliness due to an absence of interposed projections in the path of movement of the solids.

Still another object of the invention is to present a generally new screen bar of one piece construction adapted to cooperate with other like bars to produce a fabricated screen cage characterized by advantages above noted.

A further object of the invention is to provide a cage bar possessing the advantageous structural features, the inherent meritorious characteristics and the mode of operation herein mentioned.

With the above and other incidental objects in view as will more fully appear in the specificaion, the invention intended to be protected by Letters Patent consists of the features of construction, the parts and combinations thereof, and the mode of operation as hereinafter described or illustrated in the accompanying drawings, or their equivalents.

Referring to the accompanying drawing wherein is shown one but obviously not necessarily the only form of embodiment of the invention,

FIG. 1 is a view in side elevation of a screen bar in accordance with the illustrated embodiment of the invention;

FIG. 2 is a bottom plan view of the bar of FIG. 1;

FIG. 3 is an end view, looking from the lefthand end as seen in FIG. 1, of the bar of FIG. 1; showing a group of bars in assembled relation.

FIG. 4 is a fragmentary top plan view of the left end of the bar of FIG. 1;

FIG. 5 is a view in cross-section showing a plurality of bars as shown in FIG. 1 in an assembled relation, the bars comprising a fragmentary part of a press cage; and

FIG. 6 is a fragmentary top plan view of the right end of the bar of FIG. 1.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the drawings, a screen bar in accordance with the illustrated embodiment of the invention comprises an elongate bar section **10** approximately wedge shaped in cross-section whereby to provide a relatively broad base **11** and a more narrow ridge portion **12** at what may be considered inner and outer extremities thereof. At each end thereof the bar section **10** terminates

at base portion **11** in an expanded portion **10***a*. Spacer pads **14** underlie the portion **10***a*, on each side of the bar section **10**, and cooperate therewith in defining a relatively expanded head **13** at each end of the screen bar. Also on opposite sides of the bar section **10**, intermediate the heads **13** thereof, are spacer pads **15**. The described heads at the opposite ends of the screen bar, as well as the intermediate portion defined by pads **15**, project beneath or beyond the plane of the ridge portion **12** of the bar section **10**.

At the ends of the bar the ridge portion **12** is connected to the expanded heads **13** by respective inclined surfaces **16** and **17**. At the location of pads **15** the ridge portion **12** is connected to the outer end of the pads **15** by inclined surfaces **18** and **19**. The pads **14** at the ends of the bar project upwardly substantially to the plane of the base portion **11** and have each a sloping edge surface **21** facing the opposite end of the bar and merging with expanded portion **10***a* through an arcuate cam-like surface **22**. The pads **15** have sloping edge surfaces **23** and **24** facing opposite ends of the bar and merging with a connecting arcuate surface **25**, the pads **15** projecting upward or inward to a maximum height which is substantially short of the plane of base portion **11**.

The bar section **10** has a progressively changing cross-sectional width. Thus, as indicated in FIG. 2, the bar section has its greatest width at one end thereof and progressively decreases in diameter toward the opposite end thereof. Further, the spacer pads **14** and **15** all have inclined side surfaces, as indicated in FIGS. 3 and 5. Accordingly the head portion **13** at each end of the bar, as well as the intermediate portion marking the location of spacer pads **15**, tapers from relatively broad lands, **26**, **27** and **28** respectively, to the relatively more narrow base portion **11**. Still further, the side edges of the base portion **11** are formed on a radius rather than being sharp edged, with this radius progressively increasing in the same direction as the cross-section thickness of the bar section decreases.

According to a feature of the invention the screen bar is made of one piece, as by being cast in a mold. The spacer pads **14** and **15** accordingly are formed integrally with the bar section **10**, having the character of laminations on outwardly projected portions thereof. Such outwardly projected portions terminate as described in the lands **26**, **27** and **28**. These thus assume the character of longitudinally spaced apart anvil surfaces or the like useful as flanges to mount the screen bar to a supporting surface or as a place of engagement of mounting straps. The lands in either case serve to hold the bar section relatively spaced from its supporting means whereby a free flow of fluid may take place around and alongside the bar section.

In the use of the screen bar, a plurality of like bar elements are placed in side by side parallel relation with adjacent, facing pads **14** and **15** in contacting flush engagement with one another. By reason of the described inclined configuration of such pads an assembly of bars takes on an arcuate configuration, and, if the assembly is continued to sufficient extent takes a cylindrical or circular form. The contacting pads space adjacent bar sections **10** from one another leaving between them slots **29**. By reason of the tapered configuration of each bar section **10**, the separating slot **29** between adjacent bars has a correspondingly tapered configuration, progressing gradually from a maximum width at one end to a minimum width at the other end. In the use of a cage constructed with the instant cage bars, the base portions **11** define the interior surface of the cage. The bars are, moreover, so arranged that the defined slots **29** increase in width in the same direction that the material under treatment advances through the cage.

The slots **29** provide a large drainage area for fluids expressed from the material under treatment to drain freely. The gradual increase in drainage space between adjacent bars inhibits the clogging of the drainage space with large fibers and the like, such fibers being readily movable along such slots in conjunction with the advance of the solid material. The inclined edges of the spacer pads are effectively interposed in the slots **29** and provide cam surfaces whereby the solid material trailing or advancing through the slot may be deflected upward for continued passage through the press and not be trapped at the location of the spacer pads. The relatively small and gradually increasing radius along each edge of the base portion **11**, taken with the uniformly increasing width of slots, results in the material being not comminuted as in the case of sharp edged bars. The action of advancing the material through the press, as by screw flights, has a tendency to roll the fiber or solids into gradually increasing bundle sizes to prevent excessive loss of material through the bar openings. Such fiber bundles are moved by continuing advance of the mass of material through the cage and by coaction with the rounded edge configuration of the spacer pads are moved out of successively encountered slots. The screen bar illustrated may, in this connection, be one of an assembly, with there being a plurality of such assemblies arranged in end to end fashion to comprise a cylindrical or like press. Different segments of the press may in this manner take on different configurations. For example, the bar element may be made smaller at one end, at the location of the spacer heads **13** thereon, than at the other end whereby an assembly of like bars produces a conical configuration.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise but one of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. A screen bar for use in a generally circular press cage for processing material or the like, comprising an elongate bar section having an approximate wedge-like shape in transverse section, including a relatively broad surface to be disposed radially inward of the cage and sides which taper to an apex, said bar section having a gradual taper from one end to the other, said bar section further having projecting portions at each end and at least one other projecting portion intermediate its ends, said projecting portions defining spacer pads which relatively project at the sides of said bar and lands which project radially outward of said bar, said spacer pads together with said bar section defining with an adjacent similar bar section, when a plurality of said bar sections are assembled into a cage, a longitudinally extending slot of progressively changing width, the side pads, to the opposite sides of said bar section being sloped to relatively taper inwardly of the bar section from the outer surface of said lands and said side pads further having at least one edge surface which is sloped and operative, in the case of an assembled relation of a plurality of said bar sections to form a cage, to deflect solid material tending to move outwardly through the cage slots in a direction to move inwardly of the cage.

2. A screen bar for use in a generally circular press cage for processing material or the like, comprising an elongate bar section having an approximate wedge-like shape in transverse section, including a relatively broad surface to be disposed radially inward of the cage and sides which taper, said bar section having a projecting portion at each end and at least one other projecting portion intermediate its ends, said projecting portions defining spacer pads projecting from the sides of said bar section and lands which project radially outward of said bar section, similar bar sections, when assembled in adjacent side by side relation to form a cage, forming therebetween longitudinally extending slots, the outer surfaces of said side pads on relatively opposite sides of said bar section being relatively inclined to converge from the outermost surfaces of said lands and having at least one edge portion forming a cam surface on said spacer pads oriented to face inwardly of the cage and effective to deflect solid material moving thereby in a sense inwardly of the cage.

3. A screen bar for use in a generally circular press cage for processing material or the like, comprising an elongate bar section having an approximate wedge-like shape in transverse section, including a relatively broad surface to be disposed radially inward of the cage and sides which converge outwardly therefrom, said bar section having a gradual taper from one end to the other and including portions defining longitudinally spaced spacer pads projecting at its sides, said bar section when a plurality of thereof are assembled in side by side relation to form a cage defining with an adjacent bar section a longitudinally extending slot, the outermost surfaces of said side pads on the opposite sides of said bar section being convergent in a sense inwardly of the cage and including a sloped edge portion effective to deflect solid material moving outwardly past the bar section in a sense inwardly of the cage.

4. A screen bar for use in a generally circular press cage for processing material or the like comprising an elongate bar section having a shape approximately wedge-like in transverse section, including a relatively broad surface to be disposed radially inward of the cage and sides which converge therefrom, said bar section having a gradual taper from one end to the other and including longitudinally spaced projecting portions at least one of which is intermediate its ends, each said projecting portion defining a spacer pad projecting from the sides of said bar section and a land projecting radially outward of said bar section, an assembly of like bar sections placed in side by side relation with their corresponding spacer pads in relative abutment forming therebetween longitudinally extending slots of progressively changing width.

5. The structure as set forth in claim **4**, characterized by said projecting pads including inclined edge portions disposing to face inwardly of the aforementioned cage and being effective to deflect solid material which impacts thereon in a sense inwardly of the cage.

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