The present invention, prevents the wear considerably by protecting the modular panels and enhances the screening efficiency, due to the presence of replaceable rider bars. This in turn improves the stratification in the screened material.

The panel is manufactured by hot vulcanizing or casting with rubber or polyurethane, having externally reinforced/supported with the panel fixing frame under the edge surface of the panel. The panels have button fixing slots , in the screening portion (5), into which button type rider bars, ~~i.e~~ i.e. replaceable rider bars are fixed, say for example, simply by press fit. The accompanying figure 1 illustrates the screening surface of a preferred embodiment of the screen panel, according to the present invention. It shows the slot (1) for button type fixing of the rider bars (3), best shown in the accompanying figures 2 and 3. The accompanying figure 1 also shows the screen panel (2) fitted to the frame through lugs (7) and pins (8).

In the above context, it is hereby clarified that the screen panel (2), the reinforcement portion (6) to be precise, may be fitted to the frame by button type, bolting type, pin and lug type or by any other suitable technique, as would be known to persons skilled in the art and the present invention also encompasses all such techniques. This is true also for the fitting arrangement of the rider bars(3) on the screening portion of the panel as well. The accompanying figures 2 and 3 show only one such technique. Alternatively, the rider bars may be fitted in the reinforcement portion also in the same manner , ensuring that the majority of it lies in the screening portion (5).

Now coming to the accompanying figure 2, it shows how the rider bars 3 have preferably a button type fixing (4). This would be further clear from the accompanying figure 3, where the like reference numerals, represent like features. The screening portion of the panel has a slot(1)[illustrated in figure 1], into which the protrusion(4) is detachably attached by snug fitting. This slot, alternatively may be in the reinforcement portion as well, but in that event, rider bars have to be fitted therein , ensuring that the majority of it lies in the screening portion.

Since lump size particles do not come to the contact of main screening zone (or comes very less), the whole screening zone or the panel need not to be replaced. Just replacing the rider bars in the screening zone will do. There is no need to replace the entire screen panel or for that matter the entire screening zone. This

facilitates ensuring higher longevity of the screen panels and, simultaneously, ensures low cost of operation. Thus, the rider bars prolong the life of the screening elements and also reduce the cost of operation.

Further, the rider bars ensure enhancement of stratification in the screened material and thus the screening efficiency is increased as will be understood to persons skilled in the art. In particular, this is achieved by replacing the damaged rider bars from time to time so that the material to be screened is indeed screened, rigorously, according to the grain size, so that no clogging or defective/erroneous screening takes place. Hence, improved stratification is achieved.

The screen panels are preferably standard modular type,i.e- 305x305 or 300x300 or 610x300 or similar will have all the advantages of modular panels,i.e- easy to handle, down time is much less compared to existing panels for similar application. Further the panels can be of any size starting from the standard modular sizes. Rider bars are easily replacable when they get worn out, as stated before. Hence, by changing only the rider bars the screen can be used for a considerable period of time and without changing the whole screen panels. This renders the screen panels economic as well. This technology is applicable to both rubber and polyurethane panels.

Ideally, the screening surface is made of any one of or a combination of mild steel, stainless steel, rubber and/or polyurethane with or without steel reinforcing.

The comprehensive panel preferably comprises of vulcanized material, rubber polyurethane, having embedded within it steel reinforcing bars, at the outer edges of said panel and extended across the inner area of said panel, thereby providing support to said screening surface.

Further the fixing of replaceable rider bars may be done by the button type snug fitting applying the fixing means, as protected by Indian ~~patent number~~ Patent No. 23,1453 of the applicant. As explained before, other ~~type~~ types of fixing arrangements are also embraced by the present invention. For example, instead of snug fitting type of arrangement, there may be pin and lug type fixing arrangement for fixing the two portions of the panel and for fitting the panel on to the machine frame. Alternatively, there may be bolt type of fixing arrangement.

The method of manufacturing a screen panel according to the present invention includes designing a screening portion , and at least a bottom reinforcement portion, detachably attaching one or more rider bars to lie on said screening portion in the manner such as herein described and attaching said screening portion and said reinforcement section such that said rider bars can be replaced, from said screening portion as and when required.

The present invention has been described with reference to some drawings and preferred embodiments, purely for the sake of understanding and not by way of any limitation and the present invention includes all legitimate developments within the scope of what has been described hereinbefore and claimed in the appended claims.

We Claim

1. A screen panel for mining and quarrying industries adapted to be mounted on a screen deck including at least a screening portion having one or more rider bars and a bottom reinforcement portion, said screen panel being ~~designed~~ configured such that said rider bar~~(s)~~ is~~(are)~~ adapted to be replaced from said screening portion as and when required,

wherein said screening portion defines a screening surface with a material aperture extending through said screen panel,

wherein said rider bar overlays said screening surface and aligns to an edge of said material aperture.

2. The screen panel as ~~claimed~~ recited in claim 1, wherein ~~said screening portion of said screen panel has abrasion resistant apertures having a flaring design~~ said material aperture has a flared profile widening from said screening surface ~~and said screen panel is adapted to provide improved stratification~~.

3. The screen panel as ~~claimed~~ recited in claim 1, wherein said screening portion, ~~having one or more rider bars and~~ said reinforcement ~~zone~~ portion, and said rider bar form an integral screen panel module configured for removal from a screen deck as an assembly ~~are adapted to be configured as a plurality of modular units~~.

4. The screen panel as ~~claimed~~ recited in ~~any of~~ claim~~s~~ 1 ~~or 3~~, wherein said rider bars ~~are attached to a portion of said screening portion and/or said reinforcement portion by~~ include a button type snug fitting ~~or by pin and lug arrangement or by bolting or by any slot~~ coupling said rider bar to said screening surface of said screen panel.

5. The screen panel as ~~claimed~~ recited in claim ~~4~~ 1, wherein said rider bar~~s are made up of~~ includes any one or a combination of polyurethane, ~~/~~rubber, ~~/~~and steel, ~~and~~ wherein said reinforcement ~~section~~ portion is a frame made by hot vulcanizing or casting with rubber or polyurethane.

6. The screen panel as ~~claimed~~ recited in claim 1, wherein the screening ~~surface~~ portion of said screen panel ~~is made of~~ includes any one of or a combination of mild steel, stainless steel, rubber and/or polyurethane with or without steel reinforcing.

7. The screen panel as ~~claimed~~ recited in ~~any preceding claim~~ claim 1, wherein ~~the reinforcement portion of~~ said screen panel is configured for fitting ~~fitted~~ to ~~the~~ a machine frame by a button type snug fitting or by pin and lug arrangement ~~or by bolting~~.

8. The screen panel as recited in claim 1, wherein the screen panel has a standard modular size.

9. The screen panel as recited in claim 1, wherein a sidewall of said rider bar extends vertically from said aperture edge relative to said screening surface.

10. The screen panel as recited in claim 1, wherein said material aperture is a first material aperture, and further including a second material aperture extending through said screen panel, wherein said rider bar spans a portion of said screening surface disposed between said first and second material apertures.

11. The screen panel as recited in claim 10, wherein opposed side walls of said rider bar are aligned with adjacent edges of said first and second material apertures.

12. The screen panel as recited in claim 11, wherein said opposed sides walls extend vertically from said adjacent aperture edges relative to said screening surface.

13. The screen panel as recited in claim 1, wherein said rider bar includes first and second opposed side walls, said first side wall overlaying an edge of said material aperture, said second lateral edge overlaying an outer edge of said screen panel.

14. The screen panel as recited in claim 13, wherein said rider bar overlays first and second fastener slots defined within said screening portion, said first fastener

slot being bounded by said edge of said screen panel, said second fastener slot being circumferentially bounded by said screening portion of said screen panel.

15. The screen panel as recited in claim 14, wherein said rider bar includes a protrusion coupled to an underside of said rider bar, said protrusion being received within said second fastener slot.

16. The screen panel as recited in claim 15, wherein said protrusion includes a button type snug fitting.

17. The screen panel as recited in claim 14, wherein said rider bar includes a steel reinforcing element, said protrusion being coupled to said steel reinforcing element.

18. The screen panel as recited in claim 8, wherein said standard modular size is 300 millimeters by 300 millimeters, 305 millimeters by 305 millimeters, or 610 millimeters by 300 millimeters.

19~~8~~. A method of manufacturing a screen panel for mining and quarrying industries adapted to be mounted on a screen deck, including:

~~designing~~ providing a screening portion~~,~~ and at least a bottom reinforcement portion~~,~~;

detachably attaching ~~one or more~~ a rider bar~~s~~ to lie on said screening portion ~~in the manner such as herein described~~; and

attaching said screening portion and said reinforcement ~~section~~ portion such that said rider bar~~s~~ can be replaced as and when required,

wherein said screening portion defines a screening surface with a material aperture extending through said screen panel,

wherein attaching said rider bar includes overlaying over said screening surface such that said rider bar aligns with an edge of said material aperture.

20~~9~~. A screening deck for mining and quarrying industries, having mounted thereon a plurality of screen panels~~–~~, ~~–~~each said screen panel at least a screening portion having one or more ~~–~~rider bars ~~–~~and a bottom reinforcement portion, said screen panel being ~~designed~~ configured and adapted such that said one or more rider

~~bar(s)~~ bars ~~is(are) adapted to~~ can be replaced from said screening portion as and when required,

wherein said screening portion defines a screening surface with a material aperture extending through said screen panel,

wherein said rider bar overlays said screening surface and aligns with an edge of said material aperture.

~~10. The screen panel as claimed in claim no.1 is applicable for any size including modular size such as 305x305 mm and/or 300x300 mm and/or 610x300 mm and/or similar size.~~