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Support frame for ore screening panels

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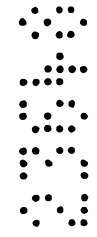
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ABSTRACT

The screening frame component 12 is formed from hard wearing polyurethane reinforced in its base portion 24 with a steel bar 25. Spacers 30 are integrally moulded onto the base 24 and incorporate a socket comprising an opening 34 and shoulder 36 that secures a screening panel 22. Drainage holes 33 are incorporated in the conical base 31 of the spacers 30 to prevent accumulation of screening fines in the socket. The frame component is also more resistant to wear and corrosion and is cheaper to manufacture.



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Applicant : *Screenex Australia Pty Ltd*
~~Richardson Pacific Limited~~ [A C N 004 067 243]

Invention Title: **Support frame for Ore Screening Panels**

The following statement is a full description of this invention, including the best method of performing it known to the applicant.

Support Frame for Ore Screening Panels

Field of the invention

5 This invention relates to improvements in ore screening panels used in the separation and grading of materials in the mining and quarrying industries and in particular is concerned with support frames for such panels.

Background to the invention

10

Screening panels of the kind described in Australian patents 482212 and 517319 are fitted to vibrating screening machines and usually they are fitted to steel frames that are adapted to support and secure the panels. These frames are themselves fitted to the steel machine frame. Examples of such frames are
15 disclosed in patents 525477 and 629881.

15

The recent trend has been to increase the open area of the screening surface and in some cases the apertured surface of the panels lies above a portion of the support frame and this effectively blocks the apertures. One attempt to overcome this problem is proposed in patent application 60531/96. There a fabricated steel
20 frame is provided with a base which incorporates spacing elements having on their upper parts securing formations to accept the protrusions depending from the edges of the screening panels. This frame has overcome the problem of blocking apertures but fine screened material tends to accumulate in the tubular spacers. One short coming with steel frames of this sort is the cost of fabrication and
25 another is the failure of the welds which secure the sockets to the base.

25

Another problem with all support frames is corrosion and wear. The steel frames are often exposed to water during screening operations and the screening material falling over the frame causes wear of the frames as well as wear on the panels.

30

One attempt to overcome wear has been to provide polyurethane shields which lie between the screening panel and the frame and deflect fines and water away from the frame. This is quite effective but involves additional inventory and additional installation time.

It is an object of this invention to overcome these problems.

Brief Description of the Invention

To this end the present invention provides a screening panel support frame component characterized by

- a) a base portion which is securable to the machine frame of a screening machine;
- b) a plurality of spacer elements projecting upwardly from said base;
- c) each spacer element having a panel securing socket at its upper end which is engageable with fastening protrusions on the screening panels;
- d) said spacer elements incorporating drainage outlets to prevent accumulation of fines and water within the socket and spacer;

said frame component being composed of a hard wearing elastomeric material.

By using an elastomeric material such as polyurethane, the frame component is made lighter and harder wearing and less subject to corrosion than the conventional steel frames.

The drainage outlet is conveniently a pair of holes in opposed sides of the spacer which communicate with the interior of the panel securing socket to enable fines to disperse. The outlets are preferably in the base of the spacers. Because the outlet holes decrease the strength of the spacer to withstand impact and vibration forces and retain the screening panels the base of each spacer is larger than the socket.

This may take the form of a tapered spacer wider at its junction with the base portion than at its junction with the panel securing socket. The spacers can be tubular with a circular or rectangular cross section. The cross sectional shape is only important in so far as it needs to complement the shape of the fastening protrusions on the panel.

Detailed description of the invention

The invention will now be described with reference to the drawings in which Figure 1 is a plan view of a screening deck utilising a frame component in accordance with this invention;

figure 2 is a plan view of a first embodiment of the frame component of this invention;

Figure 2A is a plan view of a modification of the first embodiment of the frame component;

figure 3 is a plan view of a second embodiment of the frame component of this invention;

figure 4 is a section view along the line A-A in figures 2 and 3;

figure 5 is a section view along the line B-B of figures 2 and 3;

5 and figure 6 is a section view of a screening panel fastened to the socket of the frame component of this invention.

The frame component of this invention is made from steel reinforced polyurethane and the most common form of the frame is shown in figure 2. This is used with panels that only require support on opposed edges. When greater support is
10 needed the frame illustrated in figure 3 is used. As shown in figure 1 this frame supports the panel at the edges on all four corners.

The frame component 12 consists of a base portion 24 having a general planar surface 26. The base is reinforced with a steel bar 25 to provide general rigidity to the frame. The base 24 is secured to the machine frame [not shown] by bolts [not
15 shown] through the bolt holes 48. The frame illustrated in figure 3 also includes lateral lugs 28.

Formed on the surface 26 of base 24 are the spacers 30. The reinforced base and the spacers 30 are integrally formed by casting or injection molding.

The spacers 30 each consist of side walls 32 generally defining a circular opening
20 34 in the top of the spacer to form the panel securing socket. The socket portion is internally hollow and incorporates a shoulder 36 below the opening 34. The mouth of the opening preferably includes a chamfered lip 38.

The socket portion of spacer 30 is elevated above the surface 26 by the conical base portion 31 which provides additional rigidity to the upright spacer and socket.
25 This compensates for the material removed to form the drainage holes 33 formed in the base 31 adjacent the edges of the bar 24 or the lugs 28. These drainage holes provide egress for fines which find their way into the socket through opening 34. To further reinforce the support bars, an integral web 35 of polyurethane may be provided between the sockets 30 extending up from the surface 26. This web
30 35 is shown in figure 2A and can be any height up to the top of the sockets, preferably about $\frac{1}{2}$ the socket height and of sufficient thickness to strengthen the bar and sockets.

The screening panels 22 one of which is illustrated in figure 1 consist of a screening surface 42 containing screening apertures 44. At points along the

bottom edges of the panels 22 are the securing spigots 64 comprising a neck 70 a shoulder 68 and a sloping lower surface 66. The neck 70 is dimensioned to correspond to the length of the shoulder 36 of the socket so that the spigot shoulder 68 engages with the shoulder 36 as shown in figure 6. These panels and fastening arrangements are as described in patent 482212 but can easily be changed to the pin fastening system described in patent 517319.

In figure 6 it can be seen that the space base is dimensioned so that the height 40 gives sufficient clearance between the panel 22 and the base 24. In figure 1 the panels 22 incorporate spigots at the corners and are mounted on the frame as shown in figure 3.

The frame components 12 of this invention have the following advantages over the prior art

- 1 lighter weight
- 2 resistant to wear
- 3 resistant to corrosion
- 4 do not accumulate fines which interfere with the fastening of the panels to the frame component
- 5 are cheaper to manufacture as there are no fabrication labour costs
- 6 are more reliable with no welding failure points.
- 7 Are suitable for heavy duty environments

From the above it can be seen that the present invention overcomes a range of problems in an innovative way.

The Claims defining the invention are:

1. A screening panel support frame component characterized by
 - a) a base portion which is securable to the machine frame of a screening machine;
 - 5 b) a plurality of spacer elements projecting upwardly from said base;
 - c) each spacer element having a panel securing socket at its upper end which is engageable with fastening protrusions on the screening panels;
 - d) said spacer elements incorporating drainage outlets to prevent accumulation of fines and water within the socket and spacer;
- 10 said frame component being composed of a hard wearing elastomeric material.

2. A frame component as claimed in claim 1 in which the base of said spacer is tapered in cross-section and is larger at the base than at the top.

- 15 3. A frame component as claimed in claim 1 or 2 wherein the elastomeric material is a polyurethane.

4. A frame component as claimed in claim 3 in which the base portion is reinforced with a steel bar.

- 20 5. A frame component as claimed in anyone of the preceding claims in which the frame component is strengthened by a web extending between the base portion and at least two sockets.

- 25 6. A screen deck consisting of a plurality of modular screening panels secured to support frame components as defined in any preceding claim.

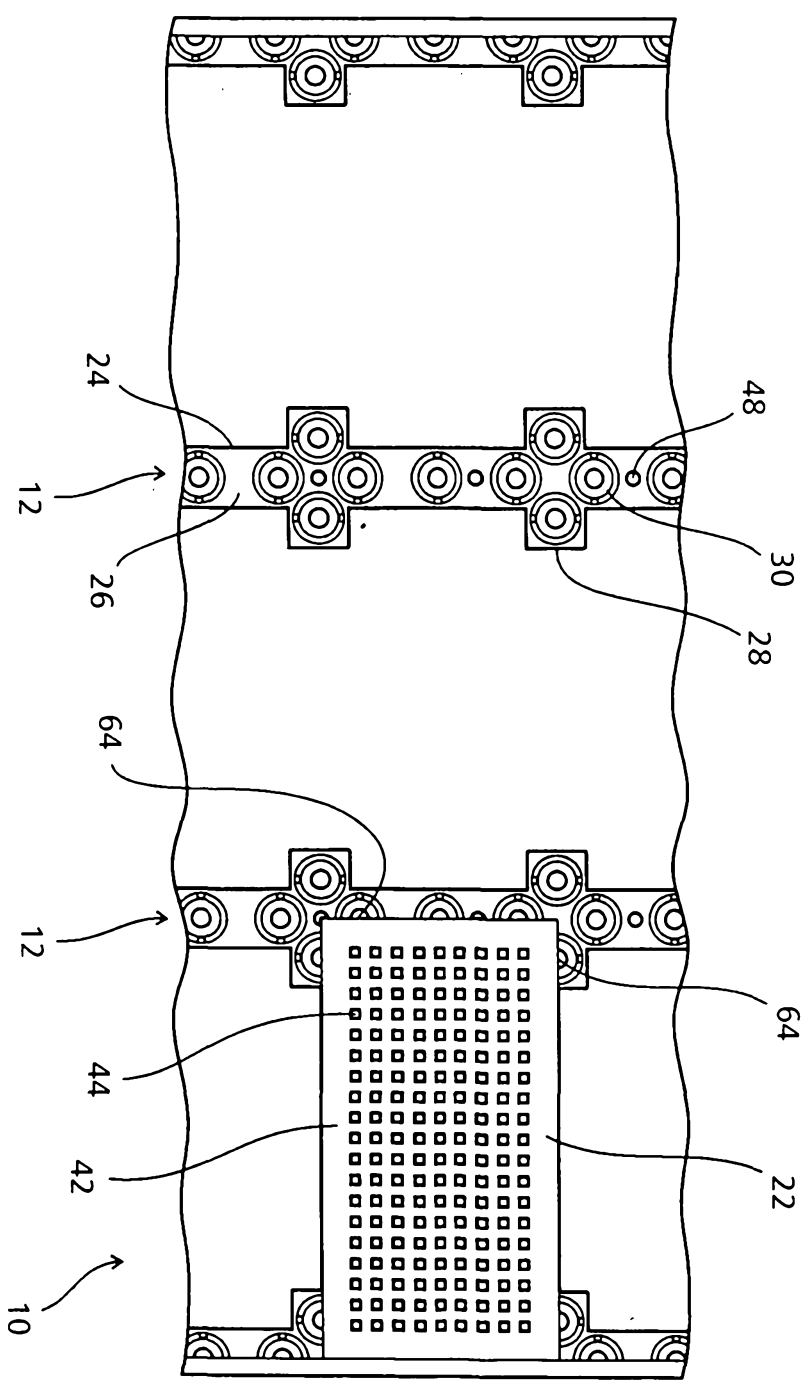
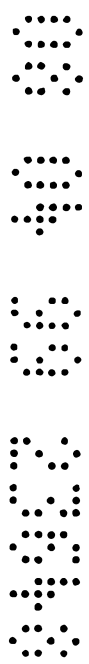
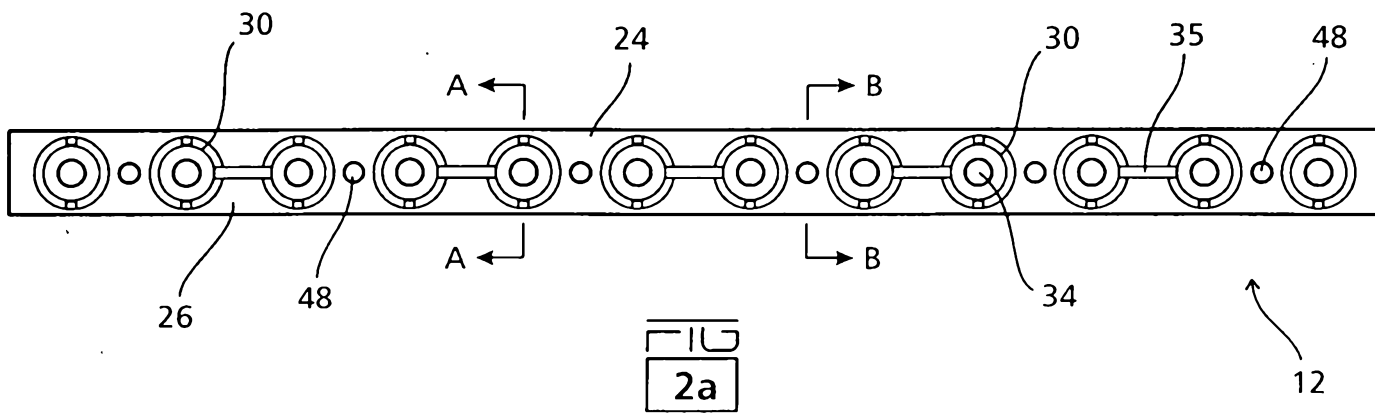
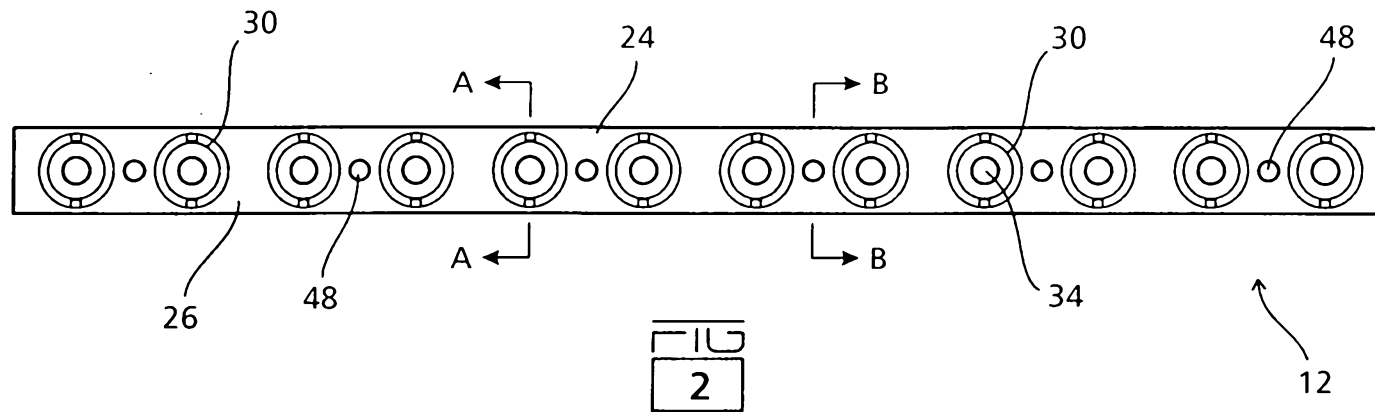


FIG 1



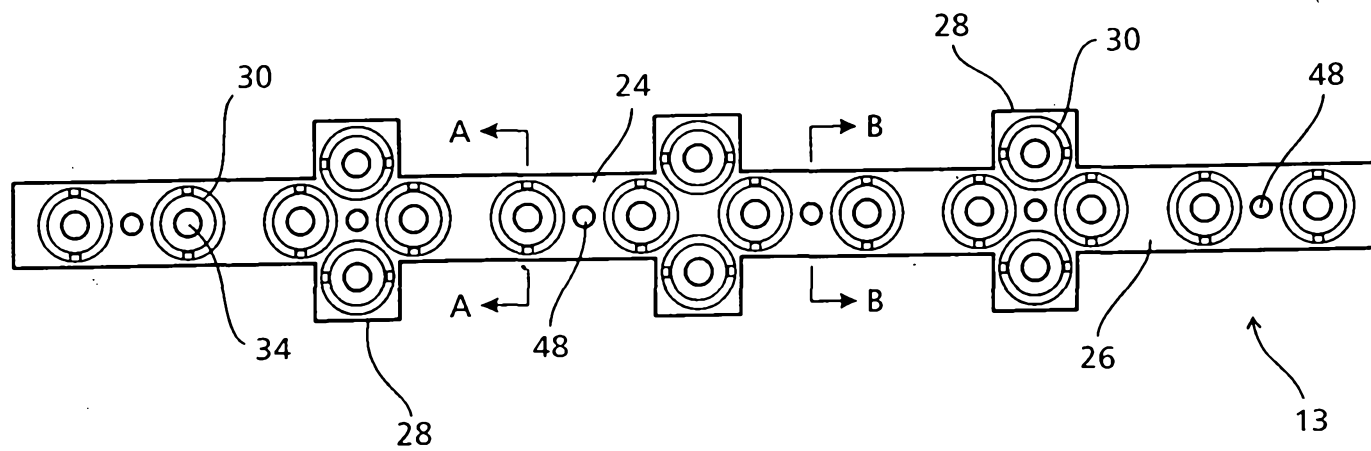


FIG
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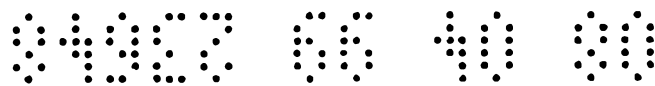


FIG. 1
FIG. 2
FIG. 3
FIG. 4

FIG. 4

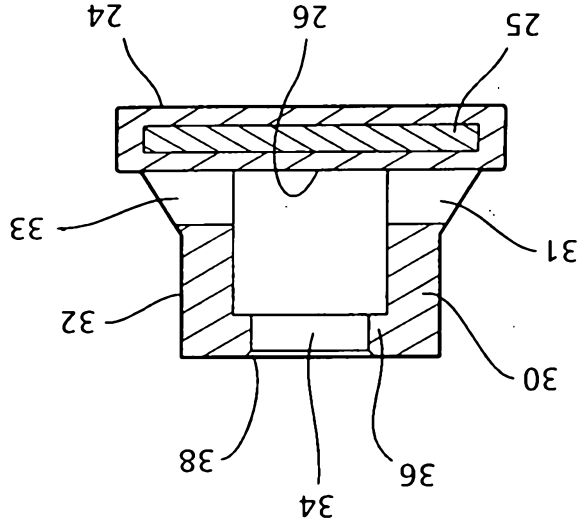
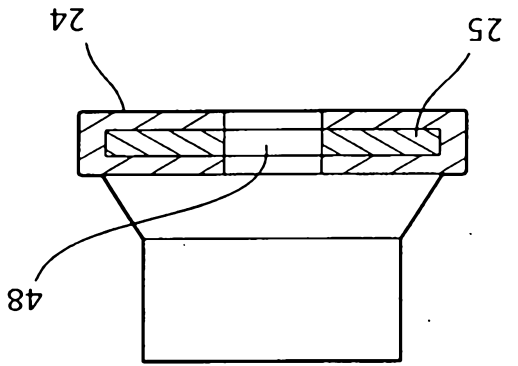


FIG. 5



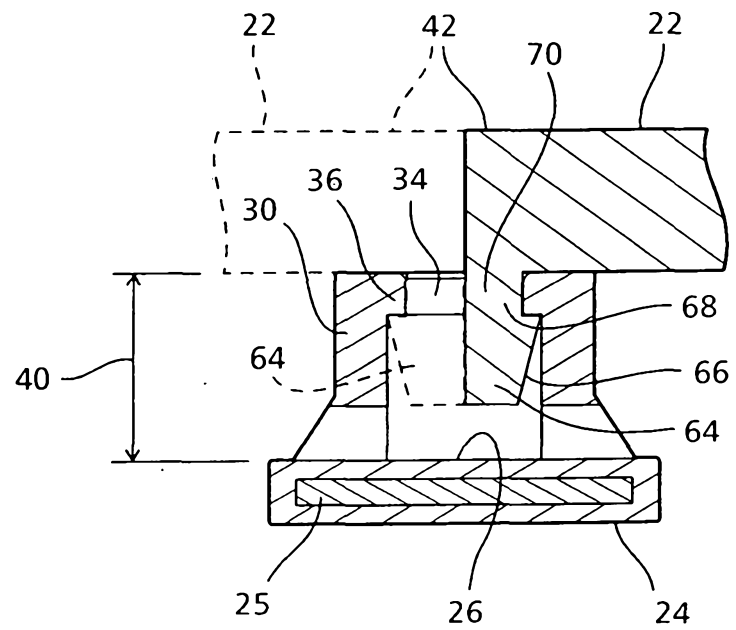


FIG
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