(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 026 961**
A2

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **80300640.2**

(22) Date of filing: **04.03.80**

(51) Int. Cl.³: **B 07 B 1/46**

(30) Priority: **06.10.79 GB 7934767**

(43) Date of publication of application: **15.04.81**
Bulletin 81/15

(84) Designated Contracting States: **AT BE CH DE FR GB IT LU NL SE**

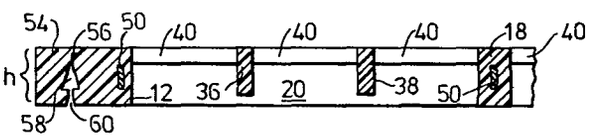
(71) Applicant: **Spiller, Clifford Michael, The Smithy, Burghwallis Doncaster DN6 GJN (GB)**

(72) Inventor: **Spiller, Clifford Michael, The Smithy, Burghwallis Doncaster DN6 GJN (GB)**

(74) Representative: **Dodd, David Michael et al, ROYSTONS 531 Tower Building Water Street, Liverpool L3 1BA (GB)**

(54) Screen element and screen module comprising such element.

(57) Figure 1 shows a generally rectangular mould polymeric screen element 1 having complementary opposed edge formations 52, 54. Channels 56 in the latter have outer parts 60 open to a side of the elements and a restricted entry to inner parts 58 for accommodating reinforcing elements (not shown), of wedge-or squaresection wire form, snap-fitting with them. An alternative oblong section reinforcement with retention lips is also shown in another figure (figure 6). A preferred fabricated strip metal reinforcement 50 saves edge 10, 12, 14, 16 and division 18, 20 widths but allows a supplying degree of curving.



EP 0 026 961 A2

Applicant/Inventor: Clifford Michael Spiller

Title: Screening

DESCRIPTION

This invention relates to screening, and in particular to sieve screens produced by connecting together a plurality of sieve elements. Such screens are used in screening machines for dewatering, grading and the like.

It is known to cast an individual sieve element in a standard size as a mesh of polymeric material having apertures of a required shape and size. The mesh is often reinforced by the incorporation of inelastic material during casting.

A plurality of such sieve elements are then bonded together to provide a sieve screen of desired overall dimensions which is then fitted over a support frame in the screening machine.

I have previously proposed that such sieve elements have complementary adjacent edge formations to interengage one with the other and for those edge formations to accommodate an elongate interlocking member passing through and bonded in a channel therethrough. In particular, I have suggested that the channel is open to one side, namely the under or downstream side, of the elements freely to accept a said elongate interlocking member subsequently bonded therein, say by filling the unoccupied channel section with the material of the screen elements or a bonding

or potting material compatible therewith.

It is an object of this invention to provide an alternative an advantageous interlocking arrangement.

According to one aspect of the invention the cross-section of an elongate interlocking member accommodation channel has an inner part corresponding closely, at least at one side when interlocked, to the cross-section of said interlocking member and an outer part to a side of the elements that is, at least adjacent to the inner part, of less width and permits snap-in fitting and retention of said interlocking member.

In one preferred embodiment, the channel cross-section is of generally key-hole shape and its outer part may be divergent sided towards the said element side but usually with a terminal spacing less than the width of the interlocking member.

In another preferred embodiment, the channel cross-section is oblong to take a correspondingly shaped rod or bar, preferably with retention lips only to one side, the inner, of projections from the sieve elements to engage in the edge of the rod or has alternately from one side and the other.

Compared with my above mentioned proposals, there is then no need for filling of unoccupied channel section space in order to achieve a desired positive and secure interlocking, and with a minimum interruption of smooth and continuous surface across joints between adjacent

screen elements. Advantages also arise in relation to peripherally bounded through-holes for interlocking members in that work space is not required for insertion of such members from one side, especially where those members are substantially rigid as is usual, and in that a closer than sliding fit can be provided between the members and the inner parts of the channels, even to the extent of obtaining a gripping contact by reason of the resilience of the screen material and very close tolerancing, even slight undersizing, of the inner part cross-section at least as to width and relative to the interlocking member, but not such as to risk distortion of the elements. There is also at least the possibility of individual element removal and replacement by knocking off and on.

There is also at least a small saving on width of the interengaging parts of the screen elements due to the absence of any requirement for clearance fitting of the interlocking member in its accommodating channel, and a substantial facilitation of obtaining touching tight fit of adjacent screen edge parts, especially if resilience of the material of the screen elements is relied upon as above or by slight misalignment of the channel inner parts in the interlocking parts of respective ones of the screen elements. Again, element distortion is however, to be avoided.

Width saving between adjacent elements is further enhanced by the use of a preferred interlocking element

of so-called wedge wire having a relatively narrow wedge-like section with its tapering convergent sides increased in convergence rate close to its narrow edge. Presentation of that narrow edge to the outer channel part also greatly facilitates insertion of the interlocking element bodily from the side of the elements through the relatively restricted outer channel part. At least as much advantage is gained from my other preferred flattish rod or bar.

I have referred to width saving as between adjacent elements and this is significant, however small, in increasing the ratio of working area equipped with apertures to total area of a multi-element screen, and my screen elements have another feature contributing substantially to this.

Polymeric materials, such as polyurethane, used for moulding screen elements have substantial flexibility, a feature which, indeed, is believed to contribute to their surprisingly long working life. The screen elements thus require reinforcement at least at their edges, and especially where, as I prefer, pluralities of elements are interconnected together to make up screens or screen parts that are suitably for direct replacement of previous wedge-wire screen elements without the necessity for a special subframe. I have found that oblong screen elements to intercouple at their long edges are extremely satisfactory if formed with a major division of apertured area from long edge to long edge with an incorporated

reinforcement following the edges and such division and fabricated from flat steel strip disposed within moulding parts depending from the apertured areas. Such very narrow reinforcement is very good for the purpose of maximising working screen area by minimising the width of reinforcement housing and, most surprisingly, further permits a screen element with quartering reinforcement of 10mm x 2.5 mm mild steel strip and measuring 272 mm x 183 mm (ex interengaging edge parts) x 25 mm (reinforcing housing height) to be bent over its width to a radius of as little as 25 cm, say for the making of centrifuge baskets.

One embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a plan view of one screening element from below;

Figure 2 is a section as A-A of Figure 1;

Figure 3 is a detail sectional view of edge intercoupling for adjacent screen elements;

Figure 4 shows alternative edge intercoupling; and

Figures 5 and 6 show alternative reinforcings.

In Figures 1 and 2 an oblong screen element 1 comprises a moulding of polymeric material, specifically with peripheral edging 10, 12 at its long sides and 14, 16 at its short sides defining the overall height h of the element. Centrally between the long side edgings

10, 12 and between the short side edgings 14, 16 are full height ribbings 18 and 20, respectively, with that 20 between the short edges of greater width. The apertured working area of the element is thus quartered into four equal areas 22, 24, 26 and 28 each comprising a grating divided into three parts 30, 32, 34 by equally spaced thin ribs 36, 38 of less than the overall height h and parallel with the longside edgings 10, 12. Each grating part comprises parallel spaced screening bars 40 with downwardly convergent sides 42. These screening bars 40 define the screening particle size, resist blockage by their tapering and are also of very considerable flexibility.

The edgings 10 to 16 and ribbings 18, 20 house a welded-up reinforcing steel frame 50 fabricated from flat strip to minimise housing width requirements and thereby maximise apertured working screen area.

The long side edgings 10, 12 have outward spaced extensions 52, 54 in a castellated manner and staggered one relative to the other so that, for long side adjacent elements, the extensions 52, 54 snugly interfit. The extensions 52, 54 have channels 56 on them that comprise in section, see Figure 3, an inner part 58 and a relatively narrow outer part 60 to their undersides 61.

Elongate interlocking member 62 can be press-fitted through the channel outer parts 60 and into the channel inner parts 58 with, at least when fitted, close sectional correspondence of the interlocking member and the channel

outer parts 60. This correspondence will, of course, normally be approximated as closely as possible in manufacture, but due to the resilience of the polymeric material, one-sided tolerances from nominal can be permitted, i.e. oversize for the interlocking member and undersize for the inner channel part.

The preferred cross-section of the inner channel parts 58 correspond to that of a wedge wire type interlocking member of which the section has convergent sides 64 from a flat relatively wide edge 66 and of initially constant slope towards its narrower edge 68 near to which the slope increases. This is readily forced narrow edge first into the channels, especially where, as shown, outer parts 60 are divergent sided though terminating at a spacing less than that of the wider wire edge 66.

Knocking-off of an individual screen element may be facilitated if the wide wire edge 66 has chamfered corners, or if the wire tapers from its largest width towards both edges, though not necessarily in the same way or to the same extent.

Extremely good close and positive interrelation of adjacent screen elements can be attained in this way.

An alternative intercoupling with inner channel part cross-sections oversize relative to the interlocking member is shown in Figure 4 where the inner channel parts 58 are offset as between the interengaging edging extensions 52, 54 to promote snug fitting, but the outer channel parts are maintained aligned so as not to

create problems on insertion of the interlocking members bodily and narrow side on.

We have described reinforcing wire of wedge-shaped section and referred to the possible double tapering thereof. In fact, experiments have shown that a square-section reinforcement is a practical proposition, especially with a similarly shaped inner cavity 58' entered at one corner as shown in Figure 5. However, a rectangular rod for example of 3:1 aspect ratio, could be used with a corresponding inner channel cavity, but still to be forced in its narrow dimension, past a constricted channel entry, and maximises strength obtained for the weight of the rod. Just such an arrangement is shown in Figure 6 with an oblong cavity 88 shaped to fit a rod or bar 90 within a side lip 92, 92' of the intercalating channeled parts of the sieve elements. That most usefully affords such lips from alternating sides thereof along the length of the rod or bar 90 when snapped into place.

0026961

Applicant/Inventor: Clifford Michael Spiller

Title: Screening

CLAIMS

1. A screen-element moulded from synthetic polymeric material and having at opposed edges thereof accommodation for an elongate interlocking member to pass through edge parts capable of interlocating with edge parts of another screen element, such accommodation comprising in cross-section a channel having an inner part to make locating contact, at least at one side, with said member and an outer part to a surface of the element with, at least adjacent to the inner part, a less width than that of said member to permit snap-in fitting and retention thereof.

2. A screen-element according to claim 1, wherein said outer part is divergent sided towards said surface.

3. A screen-element according to claim 1 or claim 2, wherein said inner part has its said one side conforming closely to a wedge-wire type said member.

4. A screen-element according to claim 1 or claim 2, wherein said inner part has its said one side conforming closely to a square-section said member.

5. A screen-element according to any preceding claim, wherein the whole of the inner part corresponds closely with said member at least when fitted.

6. A screen-element according to claim 1, wherein the inner part is of oblong section and the outer part is

defined by a lip on the inner side of the element.

7. A screen-element according to claim 5 or claim 6, wherein before fitting of said member, the inner part is at least to some extent undersize compared with said member.

8. A screen-element according to any preceding claim, wherein said inner parts are such as to be offset on interlocation with another element.

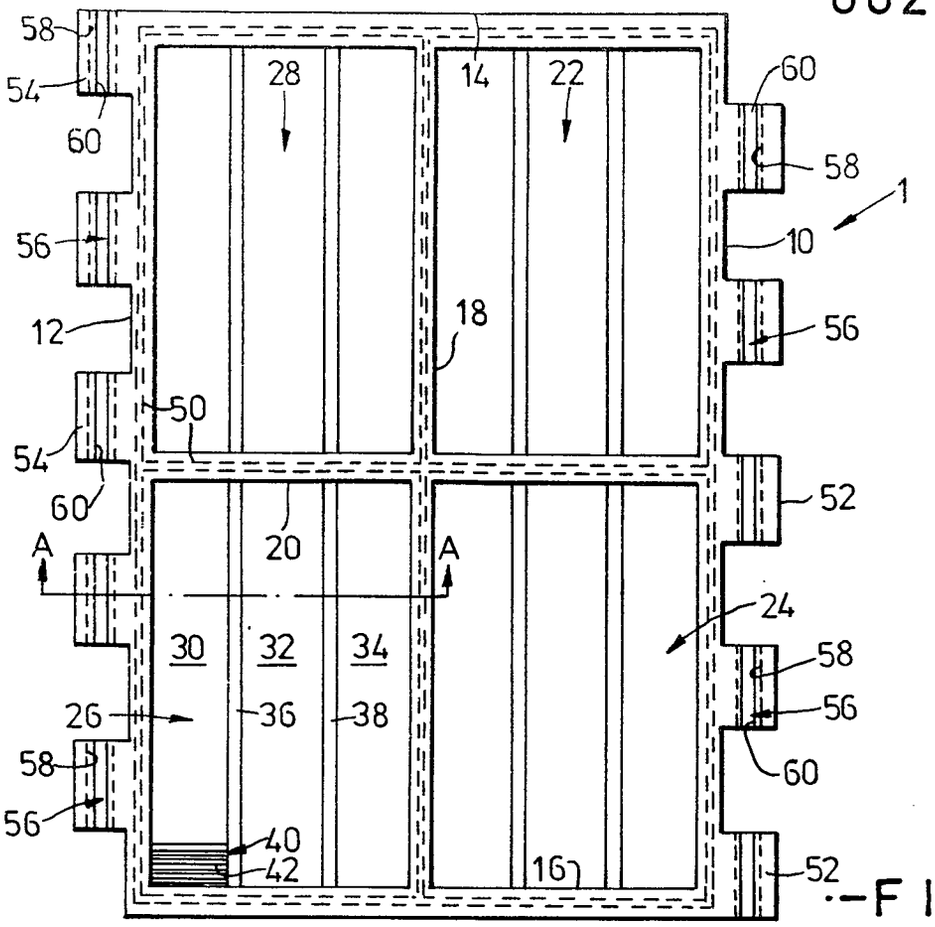
9. A screen-element according to claim 8, wherein said outer parts are nonetheless aligned on interlocation.

10. A screen-element according to any preceding claim, wherein a moulded body thereof is generally oblong for interlocation at its long edges and has a fabricated flat strip reinforcement through all its four edges and at least any medial division of apertured screen area running between its long edges.

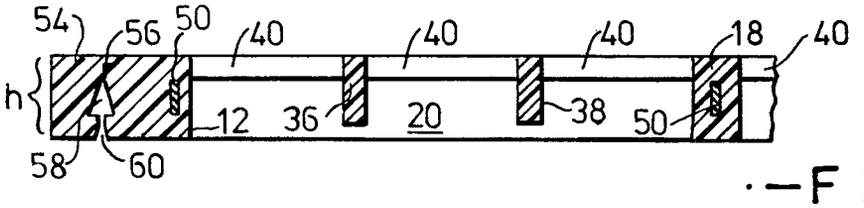
11. A screen-element substantially as herein described with reference to, and as shown in, the drawings.

12. A screen module comprising a plurality of screen elements each as in any previous claim and interlocated by a said interlocking member or members.

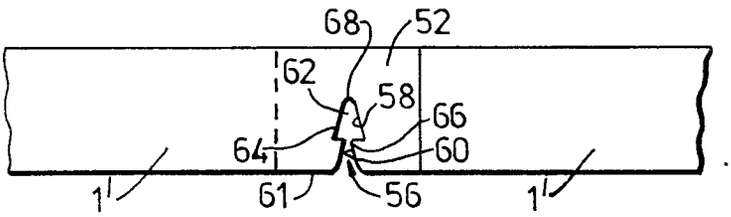
0026961



-FIG.1-

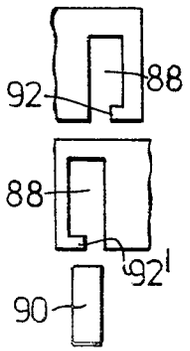


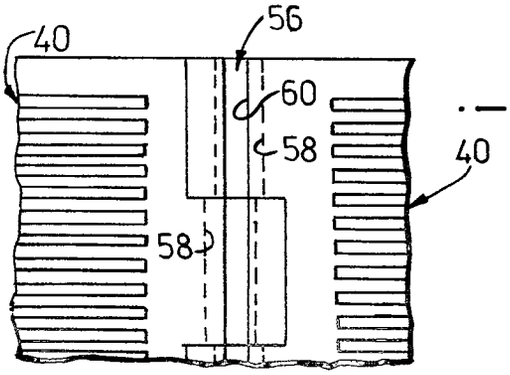
-FIG.2-



-FIG.3-

-FIG.6-





-FIG.4-

-FIG.5-