United States Patent

Harper

[15] **3,691,690**

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[54] **ABRASIVE BLAST CLEANING ARRANGEMENT**

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[52] **U.S. Cl.** **51/13,** 51/163, 198/195

[51] **Int. Cl.** **B24c 9/00,** B24b 31/10

[58] **Field of Search** 51/8, 9, 13, 14, 163; 198/195

[56] **References Cited**

UNITED STATES PATENTS

1,339,786	5/1920	Porter et al.	198/195
2,716,310	8/1955	Moore	51/13
2,792,928	5/1957	Holz	198/189
3,390,487	7/1968	Streng	51/13

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[57] **ABSTRACT**

An abrasive blast cleaning arrangement includes a slat conveyor wherein each individual slat has a removable channel shaped cap thereon. The cap and slat are secured together by studs welded to the inner face of the cap so as not to protrude through its wear face.

6 Claims, 7 Drawing Figures

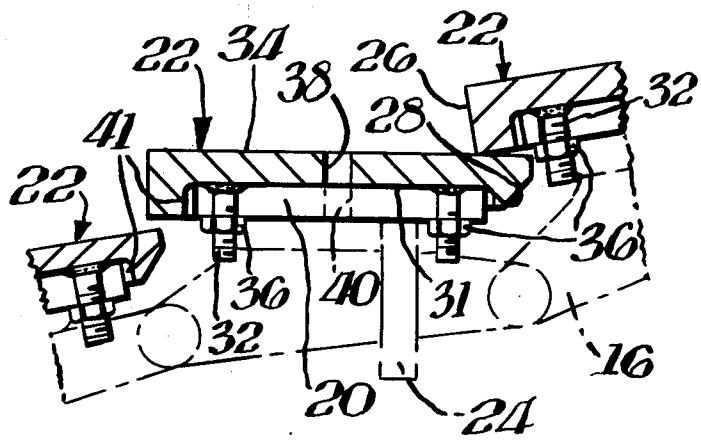


Fig. 1.

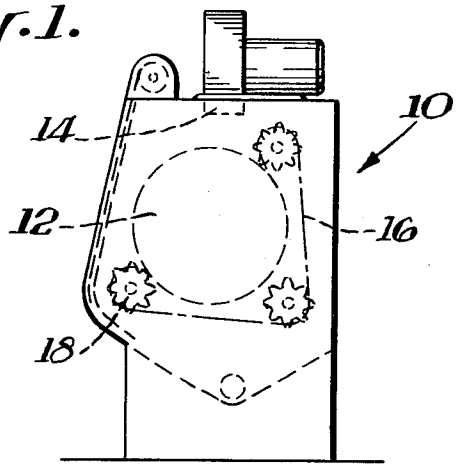


Fig. 7.

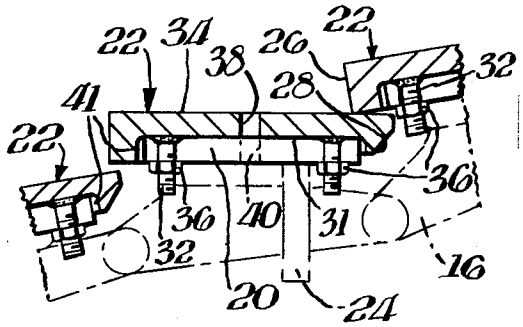


Fig. 3.

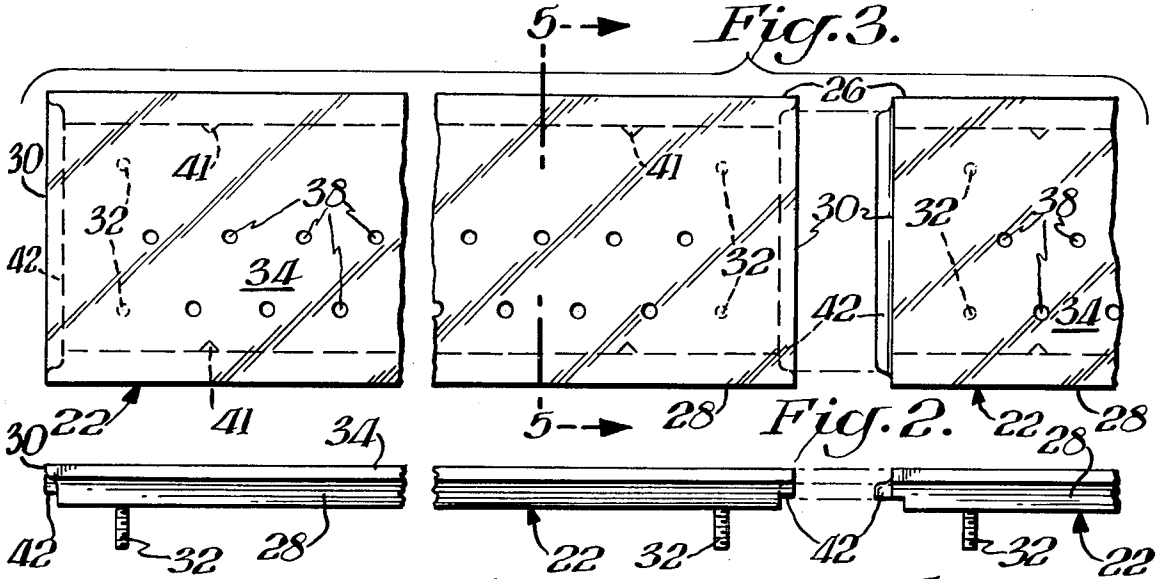


Fig. 2.

Fig. 4.

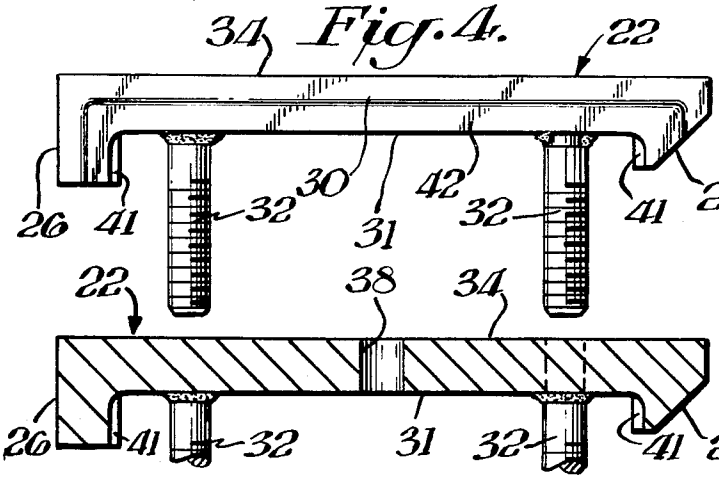


Fig. 6.

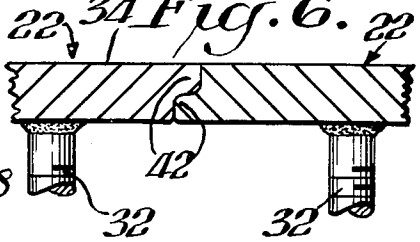


Fig. 5.

ABRASIVE BLAST CLEANING ARRANGEMENT

BACKGROUND OF INVENTION

Various types of abrasive blast cleaning devices are in existence. One such device is described and illustrated in U.S. Pat. No. 2,716,310. Devices of this general type may be used for continuous or for batch cleaning wherein parts are fed into a treating chamber in the form of a slat conveyor made generally trough shaped so as to tumble the parts and expose all parts to the blast particles projected from centrifugal throwing wheels at the open end of the trough. Conventional constructions include slats having wear resistant overlays welded in place. These overlays are generally flat rolled strips which have no extended side strips to protect the edges of the basic slat itself. During operation the blast action wears away at the edges of the basic slat to cause an undercutting and this undercutting of the basic slat under the wear resistant overlay creates a jam point. Work jamming under the overlay will thereby pry or break loose the welds holding the overlay to the slat. Various attempts have been made to weld wear resistant strips across the edge of the slats but these attempts have met with only questionable success. With such arrangements these welds wear faster than the wear resistant metal and thereby break loose.

A further disadvantage with the prior art arrangements is that because of the basic slat itself being worn by the blast action, it is necessary to replace the entire basic slat and not just the overlay when there is this premature wear.

SUMMARY OF INVENTION

An object of this invention is to provide a slat conveyor used in abrasive cleaning arrangements which has increased wear life thereof.

A further object of this invention is to provide such an arrangement which includes removable overlays whereby the overlays may be replaced without the necessity of replacing the basic slat.

In accordance with this invention an abrasive blast cleaning device includes a slat conveyor wherein each individual slat has a removable channel shaped cap thereon. The cap and slat are secured together by studs welded to the inner face of the cap so as not to protrude through its wear face. A plurality of individual caps of relatively short length may cover a single slat by providing ship lap type joints therebetween.

THE DRAWINGS

FIG. 1 is a side view of an abrasive blasting arrangement in accordance with this invention;

FIG. 2 is a side view of a slat overlay utilized in the arrangement of FIG. 1;

FIG. 3 is a plan view of the slat overlay shown in FIG. 2;

FIG. 4 is an end elevation view of the slat overlay shown in FIGS. 2–3;

FIG. 5 is a cross-sectional view taken through FIG. 3 along the line 5—5;

FIG. 6 is a cross-sectional view showing the overlapped arrangement of a pair of slat overlays such as exemplified in FIGS. 2–3; and

FIG. 7 is a cross-sectional elevation view showing a slat overlay and basic slat assembly in accordance with this invention.

DETAILED DESCRIPTION

FIG. 1 shows an abrasive blasting device **10** in accordance with this invention. The device **10** generally includes a blast chamber **12** which is trough shaped and has any suitable number of centrifugal throwing wheels **14** at the open end of the chamber. The trough shaped chamber is made in a conventional manner with an endless belt **16** formed by individual slats as later described with the belt being suitably driven by sprockets **18**.

The apparatus **10** illustrated in FIG. 1 is of the type which tumbles the workpiece so as to expose all surfaces to the blast particles thrown by centrifugal throwing wheels **14**. It is to be understood, however, that the concepts of this invention may also be utilized in other arrangements which incorporate slat conveyors (such as horizontal conveyors) to hold parts which are being treated wherein the slat conveyors would ordinarily be susceptible to rapid wear.

FIG. 7 shows an assembly incorporating individual basic slats **20** which are provided with the novel overlays **22**. In general the basic slat is made of any suitable material such as mild steel and includes an offset stiffener bar **24**. Caps **22** may be made of any suitable wear resistant material such as cast manganese steel. The individual slats and its caps or overlays **22** are arranged to overlap each other as illustrated in FIG. 7 throughout the tortuous path taken by these parts.

FIGS. 2–6 show the details of cap or overlay **22**. As best shown in FIGS. 4–5 the cap or overlay **22** is channel shaped having a pair of side flanges **26, 28** joined by a bridging member **30**. Side flange **28** is beveled for clearance purposes. A plurality of threaded fasteners or studs **32** are welded to the inner or connecting surface **31** of bridging member **30** so that the fasteners are not exposed on the wear surface **34** and thus are not susceptible to premature wear. Matching holes are provided in the basic slat so that the slat and cap may be removably secured together by any suitable coupling means such as by conventional nuts **36** for ready replacement of the worn caps.

As shown in FIGS. 3 and 5 drain holes **38** are provided in caps **22** in alignment with matched drain holes **40** (FIG. 7) in the basic slat. In this manner the spent abrasive and other contaminants may drain through the aligned holes **38, 40** without collecting on wear surface **34**. Spacers **41** on the flanges **26, 28** space cap **22** from slat **20**.

In accordance with an advantageous aspect of this invention caps **22** may be made in any suitable length with the individual caps assembled in such a manner so as to effectively form an integral unit. Thus as best shown in FIG. 6 the cap sections include mating ledges **42** which fit together to provide a ship lap type joint at each end of an assembly without any open gaps. As a result any multiple of caps can be used to cover any length slat. Moreover, because the caps can be made in short lengths the individual caps may be within the weight limits of being capable of manual handling thereby obviating the need for riggings. Additionally, because of the wrap around design provided by the channel shaped structure and because of the ability of using the caps in multiple lengths without open gaps the life of the basic slat can be extended indefinitely.

What is claimed is:

1. An abrasive blast cleaning arrangement comprising a slat conveyor for holding workpieces to be cleaned, said slat conveyor having an upper support surface, abrasive cleaning means positioned for projecting abrasive particles toward said support surface, said conveyor comprising a plurality of interconnected individual basic slats, each individual basic slat having an upper surface and sides extending lengthwise across the width of said slat conveyor, at least one wear resistant cap connected to each of said slats, each of said caps being channel shaped with a pair of side flanges interconnected by a briding member, said side flanges shielding the sides of its basic slat and said bridging member, shielding the upper surface of its basic slat, said bridging member having a wear surface remote from its basic slat, the wear surface of all of the bridging members jointly comprising said support surface, and fastening means removably connecting each cap to its basic slat.

2. An arrangement as set forth in claim 1 wherein said fastening means includes fastening elements secured to said bridging member remote from wear surface, and said wear surface being imperforate with respect to said fastening elements whereby said fastening elements are shielded from the abrasive particles by said wear surface.

3. An arrangement as set forth in claim 2 wherein at least one basic slat is shielded by a plurality of said caps, said plurality of caps being connected together by ship lap type joints formed by mating ledges on the individual caps.

4. An arrangement as set forth in claim 3 wherein said caps and basic slats include matching drain holes, said basic slats including holes through which said fasteners extend, said fasteners being threaded studs welded at one end to said bridging member, and a threaded coupling engaged with the other end of each stud.

5. An arrangement as set forth in claim 4 wherein one of said side flanges is beveled toward its basic slat, and each of said side flanges having internal spacers disposed between said side flanges and the sides of its basic slat.

6. An arrangement as set forth in claim 5 wherein said slat conveyor is trough shaped, and said abrasive cleaning means being at least one centrifugal throwing wheel disposed at the open end formed by said trough shaped conveyor.

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