

[54] **CHAMBER FOR TREATING WORK
PIECES BY BLAST**

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[51] Int. Cl.**B24c 3/14, B24c 9/00**

[58] Field of Search.....51/8, 9, 13-15;
241/36

[56] **References Cited**

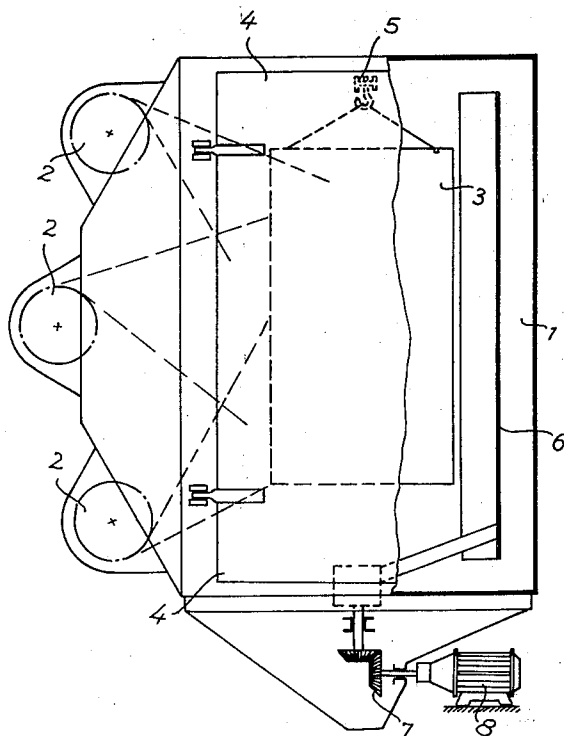
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[57] **ABSTRACT**

The specification discloses a chamber for treating work pieces by a blasting medium in which blasting devices discharge the medium into the chamber in a side opening in the chamber. Doors are provided for the chamber to permit work pieces to be placed into the chamber and removed therefrom. Also included in the chamber is a shield which moves in front of the opening for the blasting medium before the doors are opened and which moves to a position opposite the opening when the doors are closed. A control device controls the supply of blasting medium to the blasting devices and an automatic control system is provided for correlating the operation of the various devices.

10 Claims, 3 Drawing Figures



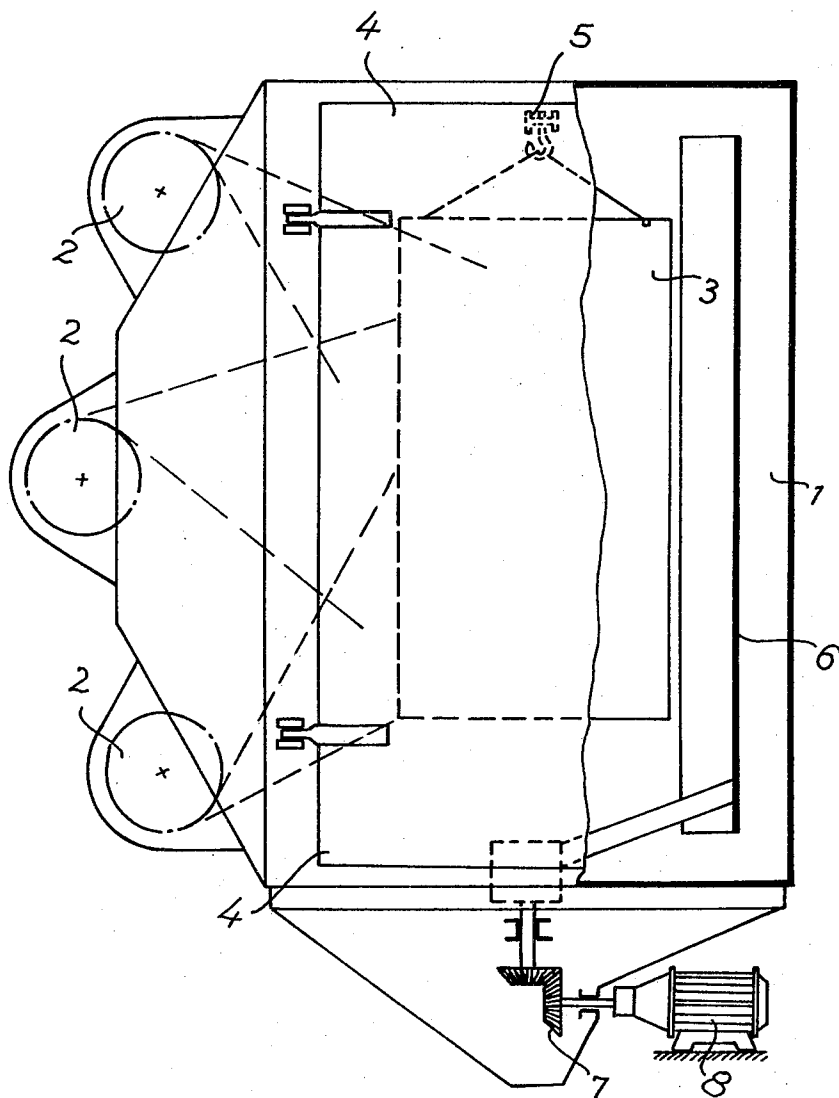


Fig. 1

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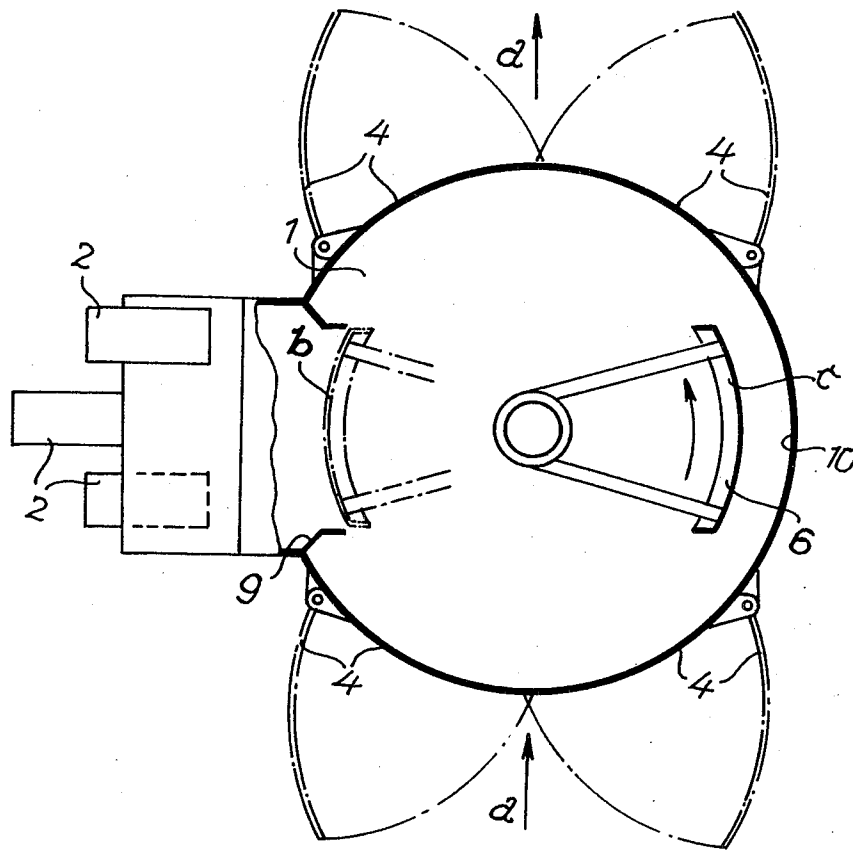


Fig. 2

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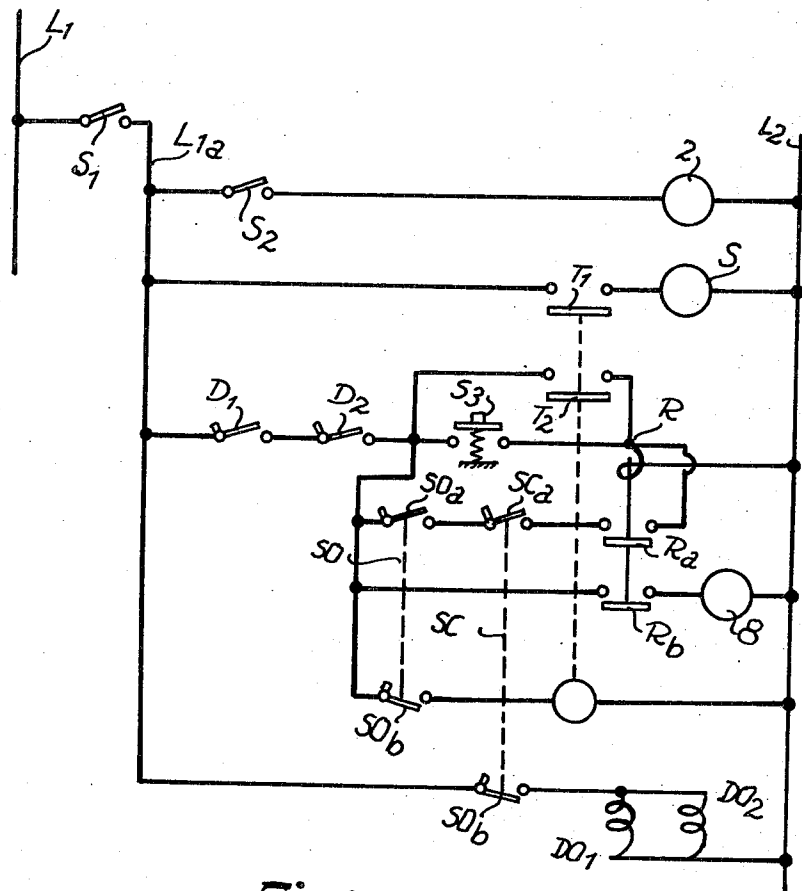


Fig. 3

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CHAMBER FOR TREATING WORK PIECES BY BLAST

The present invention relates to a chamber for treating work pieces by blast means. The invention is based on a type of blast chamber according to which the blasting range of one or more blasting devices is adapted to be closed off by a screening device, or the like, for the introduction and withdrawal of work pieces.

It is an object of the present invention to provide a blast chamber of the above mentioned type with a special screening device and special control means therefore.

The foregoing object and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. 1 illustrates partially in section and partially in elevation a blast chamber according to the invention.

FIG. 2 is a cross-section through the blast chamber of FIG. 1, said section being taken along the line II—II of FIG. 1.

FIG. 3 is a wiring diagram for the control of the screening device according to the invention.

The blast chamber according to the present invention is characterized primarily in that a screen is provided in the chamber which is pivotable therein in such a way that it may selectively be placed in a protective position in front of the chamber wall which is opposite to the discharge opening means of the blasting device, or may be placed in a position in which it covers up said opening.

When the screen has been pivoted into its protective position, it protects the chamber wall which is opposite to the blasting devices against blasting particles which are being thrown past the surfaces of the work piece or which float around in the chamber. In view of this protective screen, it will not be necessary materially to reinforce the blast chamber wall as it was heretofore necessary. Instead the wall opposite the blasting devices may be of the same thickness and quality of the material which is used for the remaining walls of the blast chamber. In this way, a considerable saving is realized inasmuch as the wear is considerably reduced by the screen moved into its protective position.

During the charging or discharging phase of the processing operation, the supply of blasting medium to the blasting device, or devices, is interrupted and the screen is moved into its opposite position as long as the chamber doors are open for the discharge of blasted work pieces and for the introduction of new work pieces. In this position, the screen will cover the opening through which blasting particles enter the chamber which will assure that no hazard will be created by blast particles entering the chamber.

When the blasting devices are designed as centrifugal wheels, they may continue to run while the screen is in its opening covering position. In such an instance it is merely necessary to interrupt the supply of blasting means to the wheels. Corresponding remarks also apply to blasting devices of different designs, for instance, of the injector type design.

Referring now to the drawings in detail, the arrangement shown therein comprises a plurality of centrifuges 2 for the blasting means, said centrifuges being ar-

ranged laterally on a blasting chamber 1 in such a way that they are able to rake over the entire interior space of the chamber 1. A supply of blasting medium, sand, shot, or glass, is provided together with a control to permit or interrupt the flow of the medium to the devices 2.

The introduction and withdrawal of the work pieces 3 to and from the chamber 1 is effected in the direction of the arrow *a* (FIG. 2) through two pairs of swing doors 4 by means of an overhead conveyor 5 or the like as indicated by FIG. 1.

Within the chamber 1 there is provided a screen or shield 6 which is pivotable about the central axis of the chamber and which consists of a particularly wear-resistant material, or is covered by such material.

The pivoting mechanism for the screen, or shield, member comprises a bevel gear transmission 7 which is operatively connected to an electric motor 8. The shield 6 has such a width (FIG. 2) that, when occupying its dot-dash line position *b*, it will close the opening 9 of the chamber 1 for the centrifugal wheels 2, and when occupying its working position *c*, in which it is pivoted 180° from position *b*, will cover that part 10 of the chamber wall which is located opposite opening 9 and within the blasting range thereby protecting the said part 10 against wear. In this way, the above mentioned advantageous effect will be realized.

It will also be appreciated that with the arrangement according to the present invention it is easier to renew or exchange a layer or plate which is weakened by wear when it is located on the shield member than it would be if the worn part were to be located on the chamber wall.

FIG. 2 shows in full lines the position of the shield member 6 and of the door wings 4 when the chamber is in operation whereas the dot-dash lines show the position of the shield member 6 and of the door wings 4 during the loading and discharging operation.

The operation of the blast chamber may be controlled by an automatic control which, in conformity with the adjustment of the desired blasting time, controls the supply of blasting medium to the centrifuging wheels 2, and also controls the drive 7 for the shield member 6 as well as the door wings 4 in such a way that the door wings can be opened only after the shield member 6 is occupying its covering up position *b*.

The drive of the wheels 2 is not stopped during the loading and discharging of the chamber, but merely the supply of blasting medium thereto is halted, which fact considerably increases the useful time of operation of the chamber. Such control may comprise a timer and limit switch means. Merely as an example, reference may be had to FIG. 3, in which L1 and L2 represent power lines. The components of the control system are connected between line L2 and a line L1a with the latter being connected to line L1 via a main switch S1.

The blasting devices 2 are connected between lines L1a and L2 and are under the control of a switch S2.

The supply of blasting medium to the blasting devices is under the control of a gate or slide valve, or the like, which is electrically operated, either by a solenoid or motor. The operator for the control of the blasting medium is indicated at S in FIG. 3 and is connected between lines L2 and L1a in series with a blade T1 of a timer.

Also connected between lines L1a and L2 is the coil of a relay R in series with a pushbutton switch S3 and normally open limit switches D1 and D2. Switch S3 is bypassed by a second blade T2 of a timer.

Relay R establishes a holding circuit through its blade Ra and through the serially arranged normally closed blades SOa and SCa of a pair of limit switches SC and SO, which lead to the side of switch S3 nearest line L1a.

The motor 8 for driving the shield member 6 is connected between line L2 and the side of switch S3 nearest line L1a through a second blade Rb of relay R.

The timer T controls blades T1 and T2 and is connected between line L2 and the side of switch S3 nearest line L1a through a normally open blade SOb of limit switch SO.

Finally, door operators, or door locks, DO1 and DO2 are connected in parallel between lines L2 and L1a in series with a normally open blade SCb of limit switch SC.

Limit switches D1 and D2 above referred to close when the doors 4 of the chamber are closed and latched.

Limit switch SO opens its blade SOa in the holding circuit for relay R and closes its blade SOb when the shield member is in the position in which it is shown in full lines in FIG. 2. Similarly, when the shield member is in its dot-dash line position of FIG. 2, blade SCa of limit switch SC opens and the blade SCb thereof closes.

In operation, switch S1 is closed to energize line L1a. Switch S2 can then be closed to energize the blasting devices 2 which will not, however, discharge any blasting medium. Assuming a work piece is placed in the chamber, the doors 4 are then closed and this will close limit switches D1 and D2. switch S3 can then be closed which will energize relay R and close its blades Ra and Rb. Closing of Rb energizes motor 8 so that the shield member will move from its b position toward its c position. As the shield member moves away from its b position the blade SCa of limit switch SC closes to establish the holding circuit for relay R so that switch S3 can be released, while simultaneously blade SCb closes and energizes the door lock mechanisms DO1 and DO2 to prevent opening of the doors 4.

When the shield member reaches its c position it will open the blade SOa of limit switch SO, thereby deenergizing relay R and halting motor 8, while simultaneously closing blade SOb and energizing timer T.

Energization of time T will close its blade T1 and energize operator S to bring about a supply of blasting medium to the blasting devices 2 for a predetermined length of time. At the end of this predetermined length of time, blade T1 opens to interrupt the supply of blasting medium to the blasting devices and blade T2 will close, thereby again energizing relay R.

Energization of relay R will again energize motor 8 so the shield member will return to its b position. Blade T2 stays closed only long enough to permit the shield member to move off limit switch SO and thereupon blade T2 can open while the shield member will continue to move towards its position b. When the shield member reaches position b it will open the blade SCa of limit switch SC to deenergize relay R, thereby bringing about deenergization of motor 8 and halting of the shield member, while simultaneously limit switch blade

SCb is closed to energize DO1 and DO2, thereby to unlock or open doors 4.

Thereafter, the blast work piece can be removed and a new one inserted and a new blasting cycle initiated by closing doors 4 and depressing switch S3.

The operators at DO1 and DO2 can consist merely of latching devices for doors 4 to lock the doors closed during a blasting operation, or the doors can be powered in one or both of the opening and closing directions, if so desired.

It is, of course, to be understood that the present invention is not limited to the particular showing in the drawing but may also be employed in connection with injector type centrifuging devices and may be used in connection with blast chambers of any desired shape.

WHAT IS CLAIMED IS:

1. Apparatus for treating workpieces by blasting with a medium which comprises: a chamber for receiving workpieces to be treated, an opening in the side of the chamber, blasting device means on the chamber adapted to expel a blasting medium through said opening and toward the opposite side of the chamber so as to treat a workpiece in the chamber, door means on the chamber circumferentially spaced from said opening for introducing workpieces into and withdrawing workpieces from said chamber, and a shield member moveably mounted in said chamber and having a first position in which it covers said opening and a second position in which it shields the side of said chamber opposite said opening.

2. An apparatus according to claim 1 in which said shield member is rotatable in said chamber between the said positions thereof.

3. An apparatus according to claim 1 in which said chamber is substantially cylindrical and said shield member is pivotally mounted therein for rotation about the axis of said cylinder for movement between the said positions of said shield member.

4. An apparatus according to claim 3 in which said opening extends substantially axially of said chamber, said door means providing axial opening means for the movement of workpieces to and from said chamber, said shield member extending axially of said chamber immediately inside the chamber and being curved to conform to the shape of said chamber.

5. An apparatus according to claim 1 which includes a motor to drive said shield member between the said positions thereof.

6. An apparatus according to claim 5 which includes means to permit said door means to open only while said shield member is in its said first position.

7. An apparatus according to claim 6 which includes means to control the supply of blasting medium to said blasting device means and operable to permit the said supply only while said shield is in its said second position.

8. An apparatus according to claim 6 which includes means to permit said shield member to move from its said first position to its said second position only when said door means is closed.

9. An apparatus according to claim 8 which includes means to control the supply of blasting medium to said blasting device means and operable to permit the said supply only while said shield is in its said second position.

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10. An apparatus according to claim 9 which includes means to interrupt the supply of blasting medium to said blasting device means a predetermined time after the initiation thereof.

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