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W. LINDEMANN ET AL

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SCRAP BUNDLING AND BRIQUETTING PRESS

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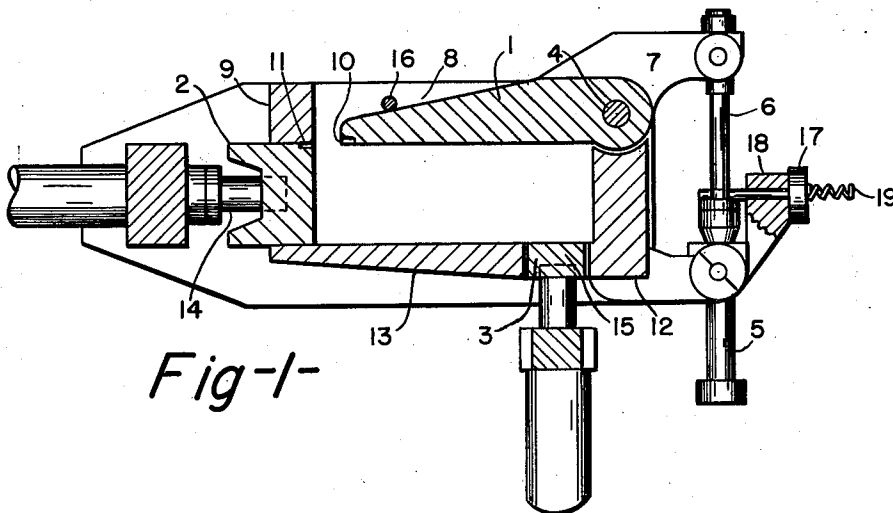


Fig-1-

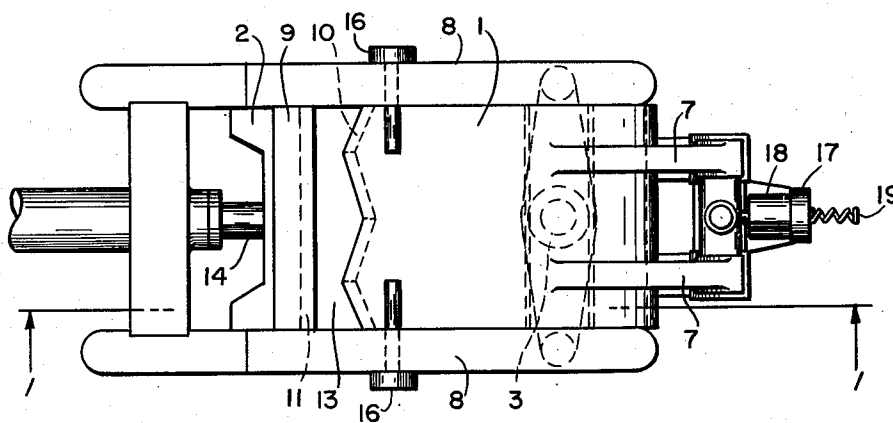


Fig-2-

INVENTORS
WALDEMAR LINDEMANN
FRITZ VAN ENDERT
BY 

ATTORNEY

UNITED STATES PATENT OFFICE

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SCRAP BUNDLING AND BRIQUETTING PRESS

Waldemar Lindemann and Fritz van Endert,
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1 Claim. (Cl. 78—.5)

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The invention relates to bundling presses and particularly to an hydraulic press for briquetting and bundling metal scrap, such as borings, turnings and the like; the invention is a continuation-in-part of our copending U. S. patent application Ser. No. 89,244 filed April 23, 1949, and now abandoned.

Experience resulting from the operation of the bundling press disclosed in U. S. Patent 1,812,797 has instigated this invention forming an important improvement of the prior press.

During the closing of the tight fitting lid of the known press, the scrap is moved in the direction of its closure movement towards its front edge. The cooperation and the contact of the front edge of the lid with the stationary counter-wedge of the press box takes place simultaneously along the whole length of the edge in contradistinction to the two lateral edges of the lid, which form, in the various positions of the lid, cutting angles with the lateral edges of the press box. The front edge of the lid actually does not form a cutting angle with the edge of the press box. Cutting without a cutting angle, which is an equivalent of stamping, however, requires a high cutting force, which in conformity with the lever rules is a minimum at the front edge of the lid.

The mounting of counter knives at the front wall of the press box in order to thereby create cutting angles, is not advisable from a practical standpoint, because the closing movement of the front edge of the lid progresses along an arc of a circle and inclined knives cannot be applied to the counterpart of a cylindrical plane. Therefore, the danger of a jamming of the scrap parts and particularly of the lid arises with inaccurately fitted edges and knives.

This danger of lid jamming is further increased by the location of the center of the lid axis or of the center of rotation of the lid, necessitated by structural reasons, at a higher level than the lower edge of the lid.

The front edge of the lid will therefore eccentrically pass the stationary box wall and contact the same prior to the closing of the lid. In the closure position, the front edge of the lid has already moved away from the front counter wall of the box. The distance between the lid edge and the counter wall of the press box is further increased in the closure position.

A scrap piece which has been jammed between the lid edge and the counter wall of the press box is jammed at an increasing degree during the ascension of the lid and the lid is

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clamped with such tremendous force that it often takes hours to remove the jammed scrap pieces and open the lid.

Moreover, protective plates often screwed to the underside of this lid are heavily damaged or torn-off. The jammed scrap pieces tear-out parts of these plates during the opening of the lid. Even frequent breakages of the press box occur; in any way, the jamming of the scrap between the lid and the front wall of the press box is a most cumbersome and dreaded disturbance of the operation of these bundling presses, since the liberation of the lid is extremely difficult and time consuming.

In conformity with the above, the following items form a serious handicap in the operation of the instant scrap bundling presses:

1. The accumulation of scrap at the front edge of the lid caused by the closing of the lid whereby the scrap is pushed towards this front edge;

2. The linear contact of the front edge of the lid with the counter or front wall of the press box and the absence of a proper cutting angle;

3. The excentric position of the front edge of the lid relative to the axis of rotation of the lid and the resulting play increase relative to the counter wall in the closure position;

4. Increase of operational costs and time caused by the release of the lid and repair of the press.

It is the main object of the invention to eliminate these disadvantages for the purpose of securing an interruption-free progress of the work.

It is also an object of the invention to effect an indirect scrap cutting action by the press lid and to transfer the actual scrap severance to other parts of the press.

It is a further object of the invention to reduce the power requirements of the press and particularly of the lid which is relieved of its direct cutting function.

It is also an object of the invention to enable a less heavy construction and mounting of the press.

With these and additional objects in view which will become apparent as this description proceeds, the invention comprises in its broad aspect the provision in the closed state of the press of a free space between the front edge of the lid and the chamber edge of the press box wherein projecting and obstructive parts of the scrap may be held without giving rise to jamming and the provision of a cutter to the

pressing plate of the front ram for cooperation with the cutter of the lid.

In consequence of this construction, the lid does not fit tightly into the press box, which is a characteristic feature of the above referred to prior press; the lid is so shaped that a sufficiently free space results between the front edge of the lid and the opposite upper edge of the press box which eliminate the jamming of obstructive scrap parts; these obstructive scrap portions are now held in the free space between the upper edge of the press box and the front edge of the lid in such a manner that all requirements prevail for a free and unhampered severing of projecting scrap parts by the plate of the press ram. The latter progresses during the compression of the scrap charged into the press box in a straight line towards the edge of the lid at the same time effecting the closure of the box in a manner similar to the cutter of steel plate shears. The press ram is so dimensioned in view of the compacting work for the compression of the scrap that it is enabled to easily sever all projecting portions of the scrap. Since the edge of the press plate and the front edge of the lid are located in the same horizontal plane, inclined cutters may be mounted, for instance at the front edge of the lid, whereby a cutting angle of any desirable inclination can be installed.

It should be noted that for the instant press where the lid does not cut itself less heavy driving means may be used.

In order to exclude an upward evasion of the front edge of the lid due to the cutting pressure of the press plate, it is advisable to either provide the lid drive with a stopping device which may be preferably automatic or to effect the stopping of the lid by bolts provided in the lateral walls of the press box.

The invention is by way of example illustrated in the attached drawing. In the drawing

Fig. 1 is a vertical sectional view of the press box on line I—I of Fig. 2; and

Fig. 2 is a top plan view of the box.

The press box composed of front wall 9, rear wall 12, lateral walls 8 and bottom 13 is provided with a horizontal preliminary press plate 2 and a vertical finishing press plate 3. Lid 1 is rotatably carried on shaft 4. The lid is hydraulically operated by the piston 6 which is movable in cylinder 5; piston 6 is connected with extensions 7 of lid 1. The two lateral sides of the lid enter closely to the walls 8 into the press box; the lid is shortened relative to the same whereby upon closure of the lid, a free space results of at least 100 millimeters and up to 150 millimeters between the front edge of the lid and the front wall 9 of the press box. The front edge of the lid is provided with cutters 10 which are alternately inclined; accordingly cutting angles will be created with the cutters 11 of the preliminary press plate 2.

The above described scrap briquetting press is operated in the following manner.

The lid 1 is moved into an essentially vertical position whereby full access is effected for the

charging of the scrap into the inner operating space of the press box. The scrap is charged and the lid is closed compressing the scrap accumulated in the press box during its downward movement and severing those scrap pieces which project over the edges of the box. At the same time, the front edge of the lid which is provided with the knives 10, catches those scrap parts which are located between itself and the opposite wall 9 of the press box and draws the same along this wall into the press box without jamming; due to the free space of between 100-150 millimeters between the lid and the box wall in the closed state of the lid. As soon as the lid has reached its final position, the preliminary pressing plate 2 is advanced whereby the scrap pieces located between lid 1 and the front wall 9 of the press box are severed by the knives 10 and 11.

Rolls 16 and/or spring 19 operated blocking means 17 located in support 18 are provided to prevent the lifting of the lid.

The essential deviation from the prior press disclosed in Patent No. 1,812,797 resides therein that the lid 1 does not fit tightly into the press box and that a free space of about 100-150 millimeters is provided between the front edge of the lid and the opposite edge of the front wall 9 of the press box in the closed state of the lid whereby the projecting scrap parts are exposed without jamming to the cutting action initiated by the press plate 2 of the preliminary press ram 14.

The invention has been described with reference to a preferred embodiment and it will be understood that many variations and modifications thereof may be resorted to without departure from the scope of the invention as defined in the following claim.

Having thus described the invention, what we claim as new and desire to be secured by Letters Patent, is as follows:

A scrap bundling and briquetting press comprising a press box composed of a rear wall, two lateral walls, a front wall and a bottom, a preliminary and a finishing press ram located in the front wall and the bottom of said press box, means to advance said preliminary ram in a horizontal and said finishing ram in a vertical direction into said press box, a closure lid pivotally attached to said rear wall, means to lower said lid into the press box for cutting cooperation with said preliminary ram, a straight cutter applied to the front edge of said preliminary ram, a zigzag shaped cutter applied to the front edge of said lid, said lid being spaced in its closure position at least 100 millimeters from the front wall of the box.

WALDEMAR LINDEMANN.
FRITZ VAN ENDERT.

REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Name	Date
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