Sept. 14, 1965 H. PALMER 3,205,693

BOARD FOR A BOARD-TYPE HAMMER

Filed Aug. 1, 1961

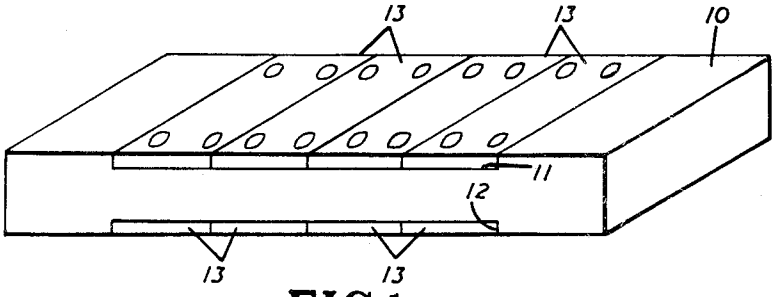



FIG. 1.

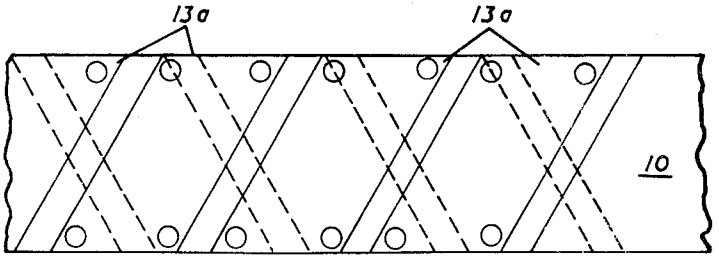



FIG. 2.

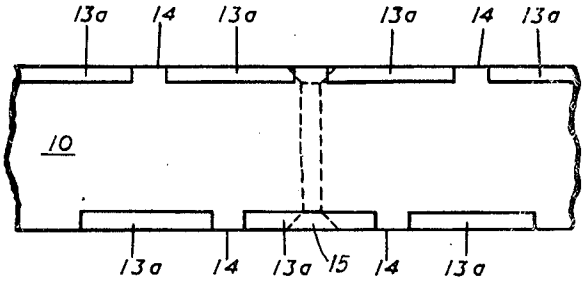



FIG. 3.

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# BOARD FOR A BOARD-TYPE HAMMER

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11 Claims. (Cl. 72—439)

The invention relates to a board for a board-type hammer, by which term is meant a hammer of which the tup is made fast at the foot of a board arranged between two, contra-rotating driven rollers which are parallelly movable toward and away from each other so that, when urged together (e.g., by an eccentric mechanism), the board will be entrained, to raise the tup, and that when moved apart, the board will be released to cause the tup to deliver a blow. For many years it has been found that these boards have an undesirably short useful life, due mainly to the action of the rollers and to the rough handling they receive in use. Various attempts have been made to prolong the useful life of the boards such, for example, by facing them with hard-wearing material, but it has been found that these hard-wearing facings are caused to flow by the pressure of the rollers such as to become distorted and curtail the useful life of the board. It is the object of the invention to provide a board, for a board-type hammer, which will have a longer useful life than such boards as hitherto known, and which will not be so liable to surface flow as a result of the grip asserted by the rollers.

According to the invention the faces of the board which are to be gripped by the rollers are faced with separate, contiguous sheets of a tough material having a low flow rate and a high coefficient of friction. By using separate, contiguous sheets of such material any slight flow occurring in any of them can be arranged not to be communicated to its neighbours but to be into a slight clearance between them, and, moreover, allows for local repair at the position of maximum wear.

According to a further feature, the sheets can be secured in recesses which are axially-spaced along the said faces of the board.

According to a still further feature the sheets can be arranged to lie obliquely across the board faces. In this way a smooth pick-up for the rollers is provided, and the sheets on opposite sides of the board can be oblique in opposite directions.

Preferably the sheets are secured to the board faces by an adhesive; and for this purpose use is preferably made of an epoxy resin and hardener, for example, a phenol-resorcinol formaldehyde resin.

According to yet another feature the sheets at opposite faces of the board are interconnected by rivets, having externally circular counter-sunk heads, and coacting washers of similar external shape, the rivet heads and washers being wedgingly located in truncated conical recesses of the sheets for their outer ends not to extend above the planes of the latter. Preferably these rivets and washers are of copper.

In the accompanying drawings:

FIGURE 1 is a perspective edge view of one form of board according to the invention;

FIGURE 2 is a plan view, to an enlarged scale, of a lengthwise portion of another form of the board, and

FIGURE 3 is an edge view of FIGURE 2.

The board shown in FIGURE 1 comprises a body **10** formed from a stack of thin laminations of Danish beech adhered together in any suitable known manner with the grain of each lamination in the longitudinal direction. The lengthwise portions of the faces which are to coact with the rollers are recessed at **11, 12** to a depth of about



¼", and a plurality of sheets **13** of a tough material, having a low flow rate and a high coefficient of friction, are placed edge-to-edge in the recesses. It is arranged for the outer surfaces of the sheets to be co-planar with the unrecessed portions of the faces of the board; and it is found that the small clearances between the sheets will accommodate any slight plastic distortion which may occur during use.

The material chosen for the sheets is preferably a highly compressed composition of cotton and a phenolic resin binder, and the sheets are secured in the recesses by an epoxy resin and hardener such as a phenol-resorcinol formaldehyde resin. The sheets at opposite sides of the body **10** are shown additionally held in position by copper rivets **15** having counter-sunk heads which engage in conical recesses of the sheets at one side of the body **10**, and have their free ends peened into engagement with coacting conical washers located in conical recesses in the sheets at the other side of the body **10**. These rivets and washers are preferably of copper.

In the construction shown in FIGURES 2 and 3 the sheets **13***a* are somewhat of lozenge-shape and are laid in individual recesses separated by lands **14** of the body **10**. The exposed surfaces of the sheets and lands are arranged to be co-planar. As shown, it can be arranged for the sheets at opposite sides of the body **10** to lie obliquely in opposite directions.

By choosing appropriate material for the body and the sheets, and for the adhesive to hold them in position, and by providing slight clearance at the ends of the sheets, it has been found that a board in accordance with the present invention has a useful life of more than 10 times that of the boards previously used. This is an important factor in production from the hammer as not only are the previously-known boards, as well as the boards of the invention expensive, but a considerable time, with a resultant interruption of production, is necessary to replace them.

What I claim as my invention and desire to secure by Letters Patent of the United States is:

1. A board, of which opposite parallel faces are adapted to be gripped between contra-rotating driven rollers of a board-type hammer machine for raising a tup secured to the foot of the board to a point at which the rollers will release the board for enabling the tup to deliver a blow by gravity, comprising a wooden body, and a plurality of separate sheets of a tough material having a low flow rate and a high coefficient of friction secured to each of two opposite sides of said body in longitudinally spaced relationship to provide the faces to be gripped by the rollers.

2. A board, of which opposite parallel faces are adapted to be gripped between contra-rotating driven rollers of a board-type hammer machine for raising a tup secured to the foot of the board to a point at which the rollers will release the board for enabling the tup to deliver a blow by gravity, comprising a wooden body, said body formed with axially-spaced, transversely-extending recesses of uniform depth along each of two opposite sides thereof, a plurality of separate sheets of a tough material having a low flow rate and a high coefficient of friction, said sheets of the same dimensions as said recesses, and means securing one of said sheets in each said recess to provide the faces to be gripped by the rollers.

3. A board, of which opposite parallel faces are adapted to be gripped between contra-rotating driven rollers of a board-type hammer machine for raising a tup secured to the foot of the board to a point at which the rollers will release the board for enabling the tup to deliver a blow by gravity, comprising a wooden body, said body formed with axially-spaced recesses of uniform depth

along each of two opposite sides thereof, said recesses having their adjacent sides parallel to each other but extending obliquely across said body, a plurality of separate sheets of a tough material having a low flow rate and a high coefficient of friction, said sheets of the same dimensions as said recesses, and means securing one of said sheets in each said recess to provide surfaces to be gripped by the rollers.

**4.** A board, according to claim **3**, in which the direction of obliquity of the recesses at one side of the body is the reverse of the direction of obliquity of those at the other side thereof.

**5.** A board, of which opposite parallel faces are adapted to be gripped between contra-rotating driven rollers of a board-type hammer machine for raising a tup secured to the foot of the board to a point at which the rollers will release the board for enabling the tup to deliver a blow by gravity, comprising a wooden body, a plurality of separate sheets of a tough material having a low flow rate and a high coefficient of friction, adhesive means securing said sheets to two opposite sides of said body in longitudinally spaced relationship to provide the faces to be gripped by the rollers.

**6.** A board, according to claim **5**, in which the separate sheets at one side of the body are additionally secured to respective separate sheets at the other side of said body by means extending through said body.

**7.** A board, according to claim **6**, in which the means which extends through the body for securing a sheet at one side thereof to a sheet at the other side thereof comprises a bolt having a truncated conical head, and a truncated conical nut, the sheets being interconnected provided with conical recesses to accommodate the bolt head and nut respectively, and the body and sheets provided with a through-hole through which the bolt extends.

**8.** A board, of which opposite parallel faces are adapted to be gripped between contra-rotating driven rollers of a board-type hammer machine for raising a tup secured to the foot of the board to a point at which the rollers will release the board for enabling the tup to deliver a blow by gravity, comprising a wooden body composed of resin-bonded laminae, said body formed with axially-spaced, transversely-extending recesses of uniform depth along each of two opposite sides thereof which are parallel to said laminae, a plurality of separate sheets of a tough material having a low flow rate and a high coefficient of friction, said sheets of the same dimensions as said recesses, and adhesive means securing one of said sheets in each said recess to provide the faces to be gripped by the rollers.

**9.** A board, of which opposite parallel faces are adapted to be gripped between contra-rotating driven rollers of a board-type hammer machine for raising a tup secured to the foot of the board to a point at which the rollers will release the board for enabling the tup to deliver a blow by gravity, comprising a wooden body composed of resin-bonded laminae, said body formed with axially-spaced recesses of uniform depth along each of two opposite sides thereof which are parallel to said laminae, said recesses having their adjacent sides parallel to each other but extending obliquely across said body, a plurality of separate sheets of a tough material having a low flow rate and a high coefficient of friction, said sheets of the same dimensions as said recesses, and adhesive means securing one of said sheets in each said recess to provide the faces to be gripped by the rollers.

**10.** A board, of which opposite parallel faces are adapted to be gripped between contra-rotating driven



rollers of a board-type hammer machine for raising a tup secured to the foot of the board to a point at which the rollers will release the board for enabling the tup to deliver a blow by gravity, comprising a wooden body composed of resin-bonded laminae, said body formed with axially-spaced recesses of uniform depth along each of two opposite sides thereof which are parallel to said laminae, said recesses having their adjacent sides parallel to each other but extending obliquely across said body, the direction of obliquity of said recesses at one side of said body being the reverse of the direction of obliquity of said recesses at the other side of said body, a plurality of separate sheets of a tough material having a low flow rate and a high coefficient of friction, said sheets of the same dimensions as said recesses, and adhesive means securing one of said sheets in each said recess to provide the faces to be gripped by the rollers.

**11.** A board, of which opposite parallel faces are adapted to be gripped between contra-rotating driven rollers of a board-type hammer machine for raising a tup secured to the foot of the board to a point at which the rollers will release the board for enabling the tup to deliver a blow by gravity, comprising a wooden body composed of resin-bonded laminae, said body formed with axially-spaced recesses of uniform depth along each of two opposite sides thereof which are parallel to said laminae, said recesses having their adjacent sides parallel to each other but extending obliquely across said body, the direction of obliquity of said recesses at one side of said body being the reverse of the direction of obliquity of said recesses at the other side of said body, a plurality of separate sheets of a tough material having a low flow rate and a high coefficient of friction, said sheets of the same dimensions as said recesses, adhesive means securing one of said sheets in each said recess, said sheets at opposite sides of said body forming opposed pairs and being formed with aligned conical recesses, said body formed with a through-hole aligned with said recesses, respective bolts extending through said aligned conical recesses and through-holes, said bolts having truncated conical heads seating in the conical recesses at one side of said body, truncated conical nuts respectively engaged with said bolts and seated in the conical recesses at the other side of said body, said sheets providing the faces to be gripped by the rollers.


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