

Feb. 6, 1951

W. E. BOWERSOCK
FEEDER BAR FOR FEEDING SHEETS
OF CARDBOARD OR THE LIKE
Filed March 13, 1948

2,540,162

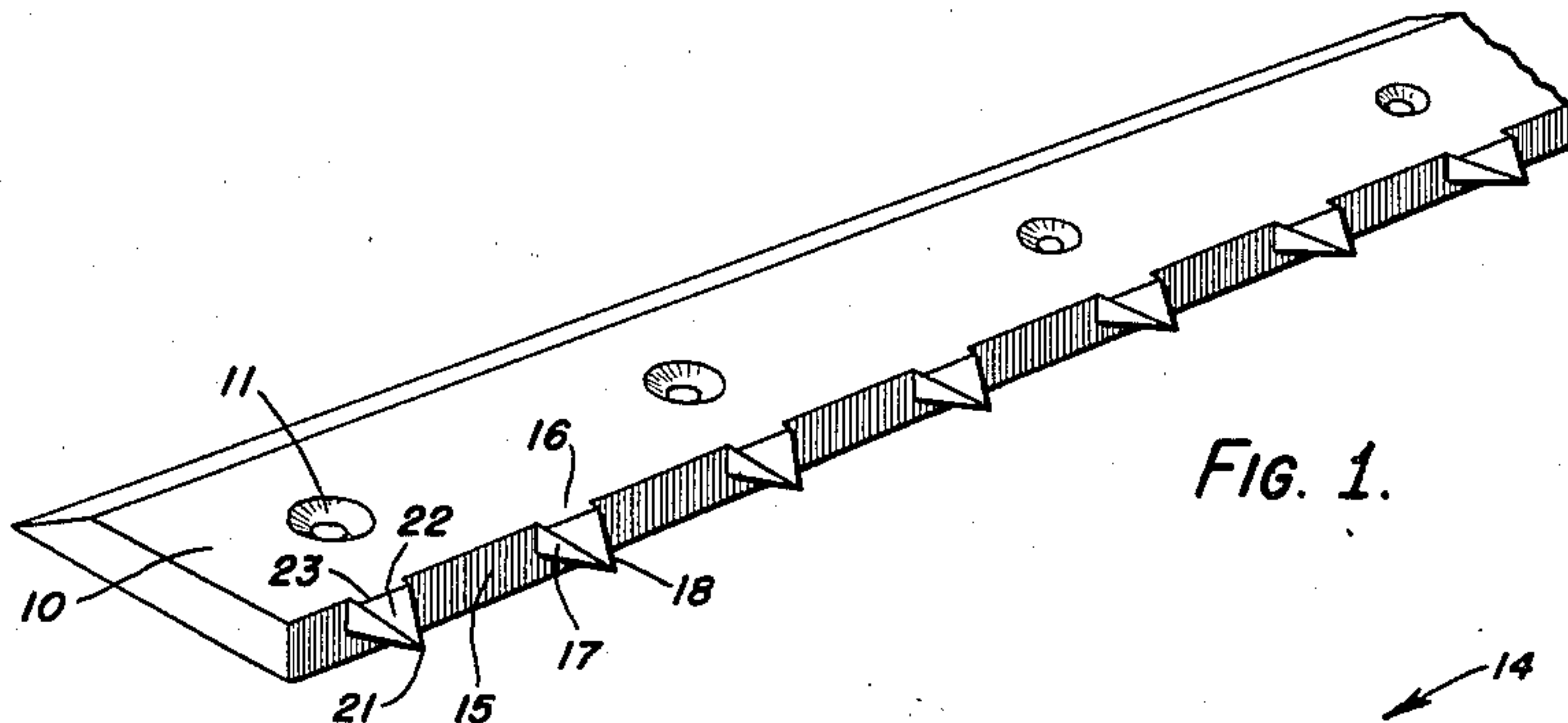


FIG. 1.

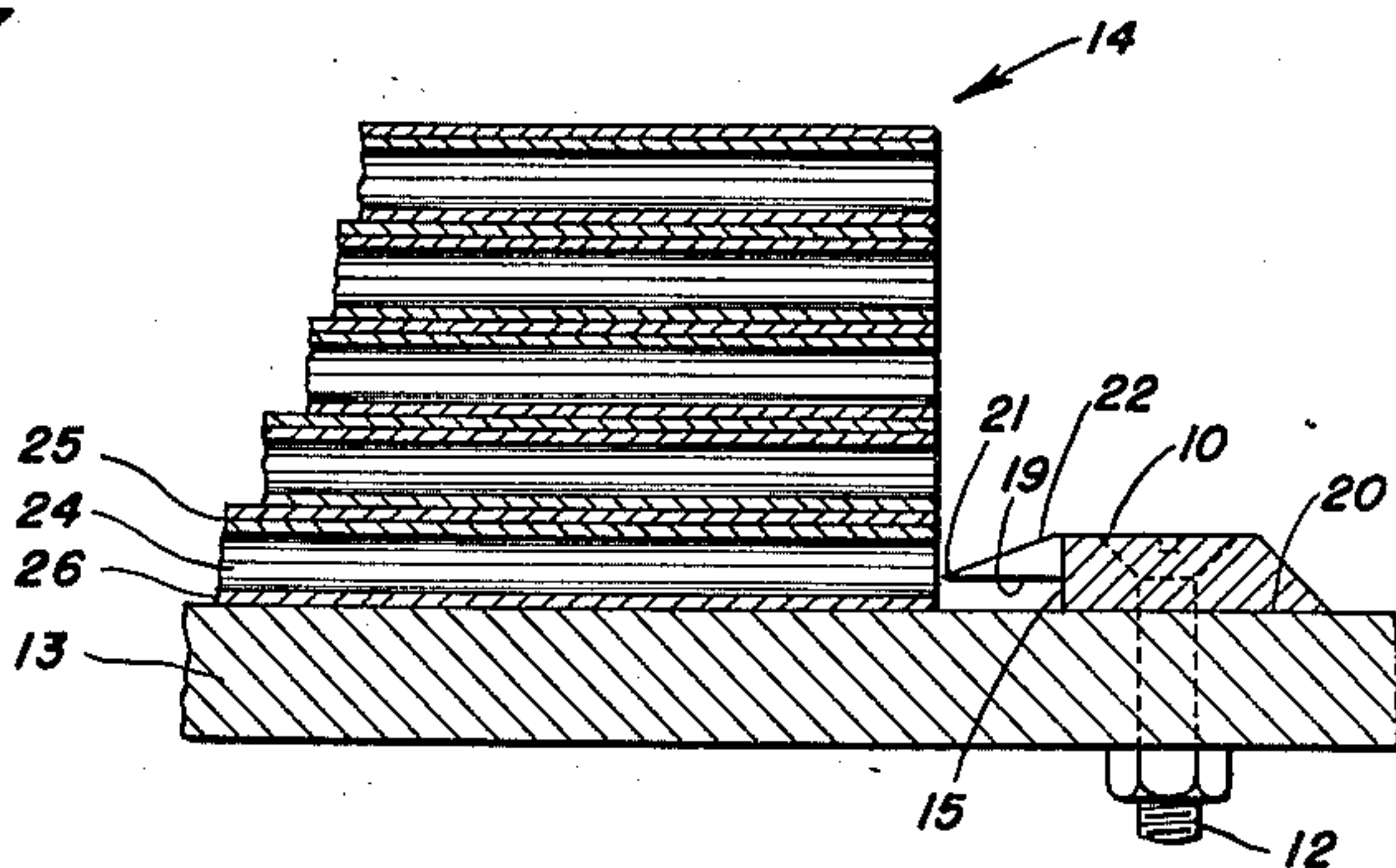


FIG. 2.

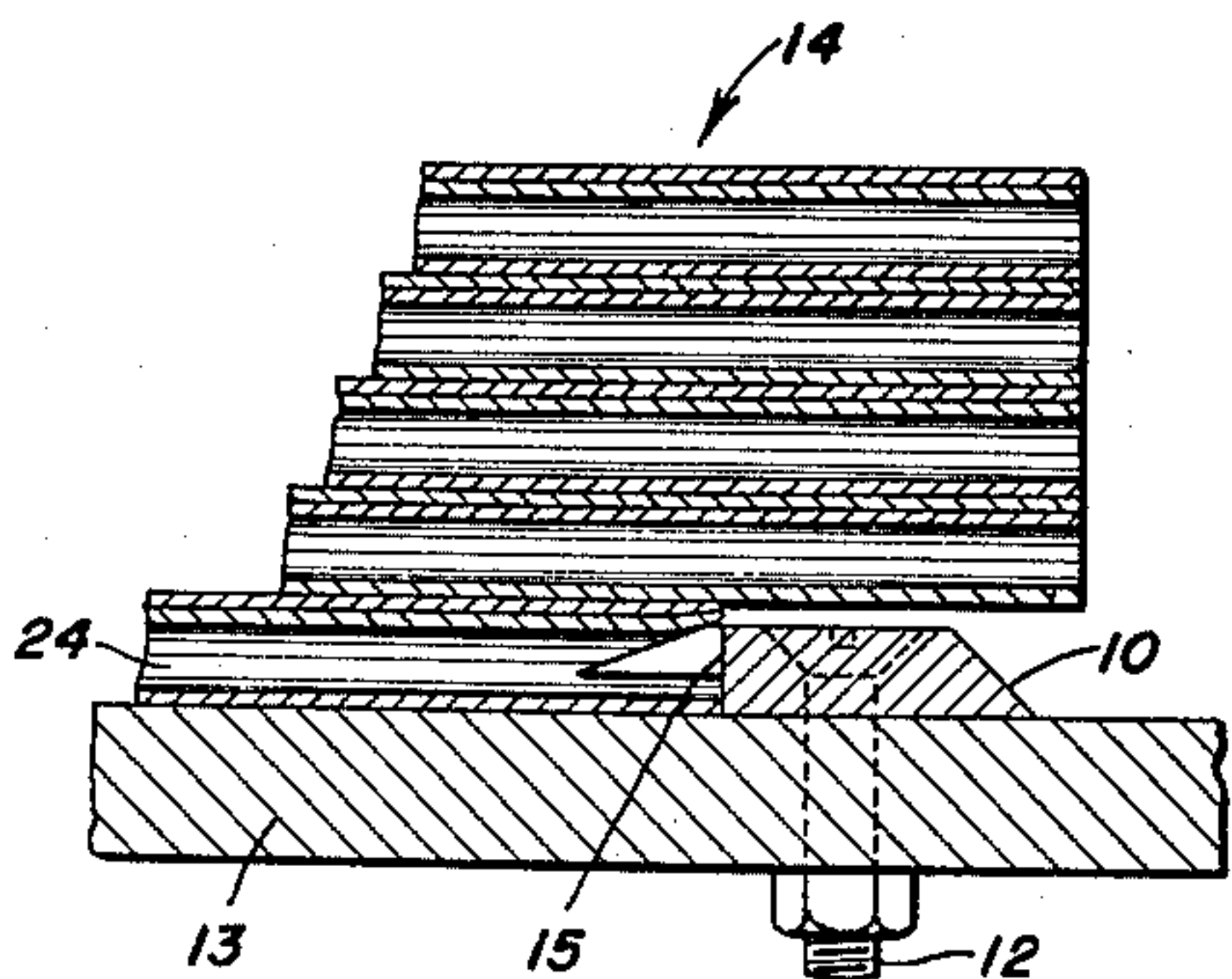


FIG. 3.

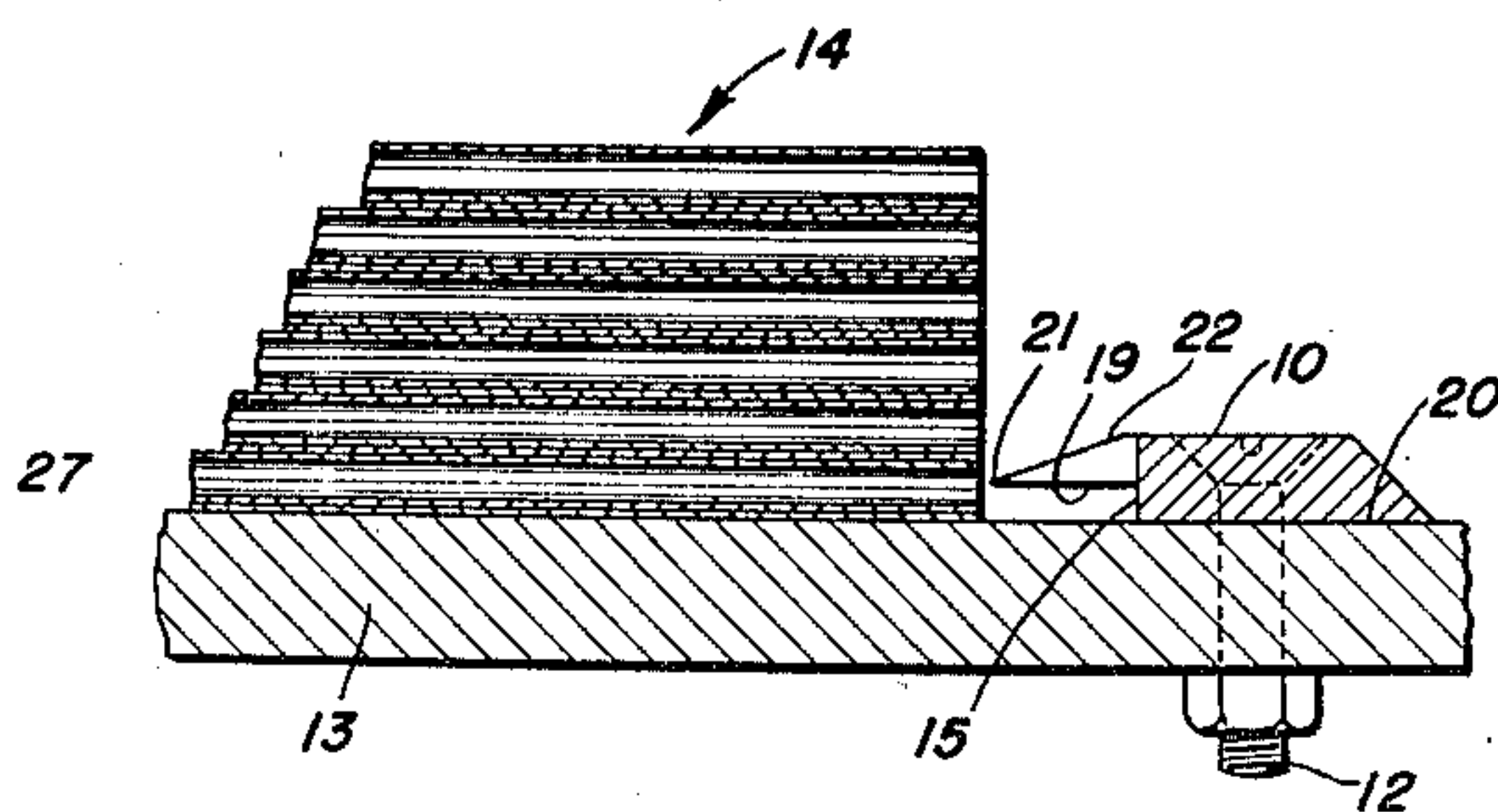


FIG. 4.

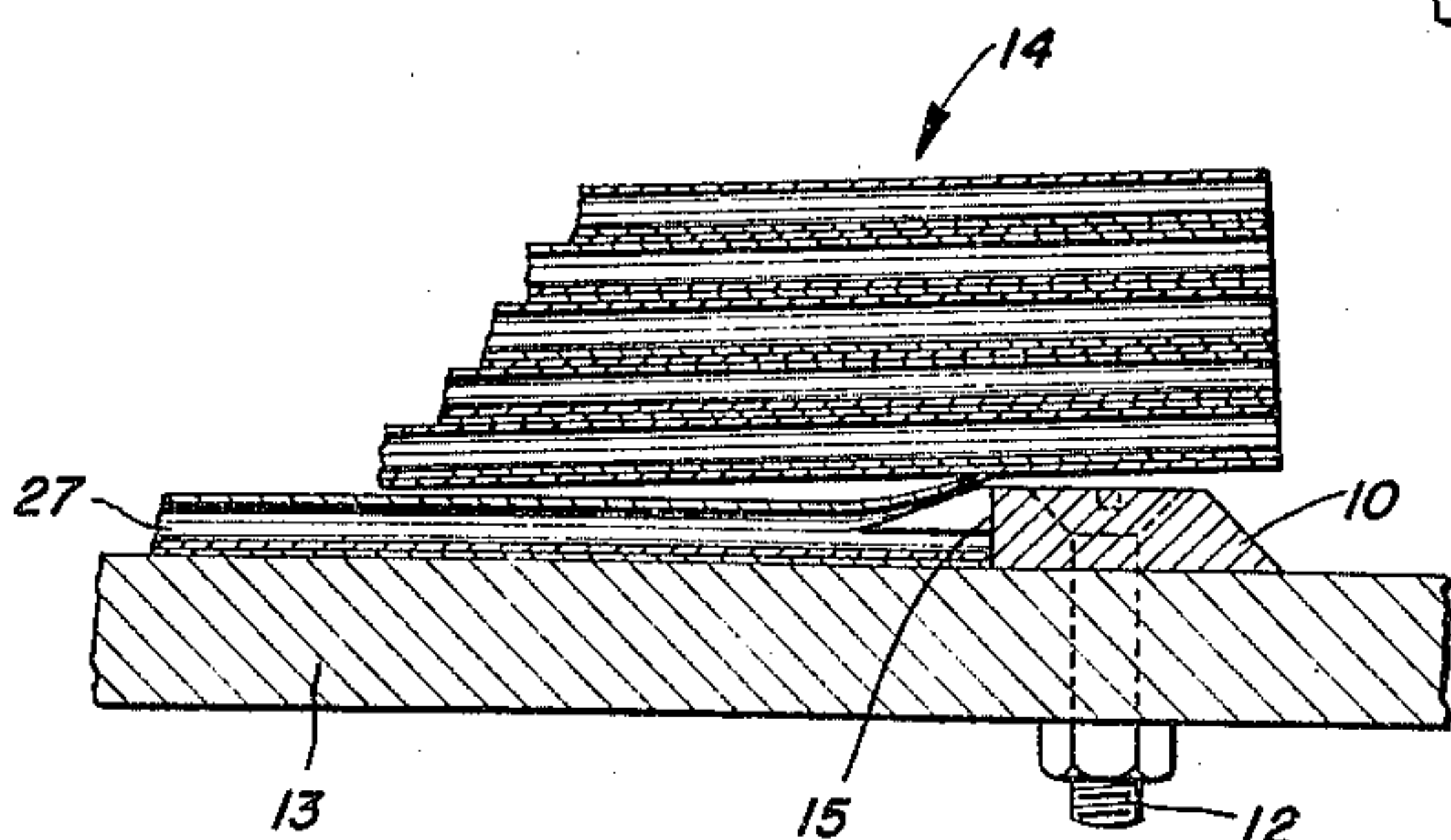


FIG. 5.

INVENTOR.
WILBER E. BOWERSOCK
BY
Edward Rumpston
HIS ATTORNEY

UNITED STATES PATENT OFFICE

2,540,162

FEEDER BAR FOR FEEDING SHEETS OF
CARDBOARD OR THE LIKE

Wilber E. Bowersock, Rochester, N. Y.

Application March 13, 1948, Serial No. 14,656

5 Claims. (Cl. 271-44)

1

This invention relates to feeder bars, and, more particularly, to the variety adapted for feeding the lowermost sheet or blank of cardboard or the like from a quantity thereof stacked in a hopper, of a box blank folding machine, for example, one object of the invention being to provide an improved feeder bar of this type having a construction capable of operating in a more efficient and reliable manner.

Such feeder bars require a minimum thickness in order to insure sufficient strength and rigidity. On the other hand, they are subject to employment for feeding relatively thin sheets and it not infrequently happens that such sheets, particularly of the corrugated board variety, are inadvertently crushed at their edge portion, so as to materially reduce their thickness at such an edge. As a result, it commonly happens that the ordinary feeder bar overlaps and feeds two sheets or blanks at a time, which jam or even injure mechanism, so as to require stoppage of the machine for clearing it of spoiled blanks or adjusting or repairing its parts. Another object, therefore, is to provide a feeder bar of substantial thickness and strength in a form of construction adapted for feeding blanks of minimum thickness, equal to or less than the thickness or height of the bar itself, in a reliable manner, one at a time, so as to avoid interference with the operation of the machine.

To these and other ends, the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a perspective view of a gripper bar embodying the present invention;

Fig. 2 is an enlarged, transverse, sectional elevation of the bar bolted to a feed plate and showing the same about to feed a blank having a thickness substantially equal to that of the bar;

Fig. 3 is a view similar to Fig. 2, but showing the blank being fed by the bar;

Fig. 4 is a view similar to Fig. 2, but showing the bar about to feed a blank of substantially less thickness than that of the bar, and

Fig. 5 is a view similar to Fig. 4, but showing the blank being fed by the bar.

The embodiment of the invention at present preferred and herein disclosed, by way of illustration, comprises a feed bar 10 made of carbon steel and of substantially minimum thickness or height of, say, 0.100 of an inch. Such a bar is

2

formed with a series of bolt holes 11 and is secured by means of bolts 12 so as to extend transversely of the usual feed plate 13, which is reciprocated by any suitable means (not shown) beneath a stack of blanks in a hopper of a blank feeding machine, for feeding the bottom blank forwardly at each forward reciprocation of the feed plate, as well understood in the art.

The feed bar of the present invention is formed at its forward side with an upright or vertical feeding shoulder 15, preferably of the same height as the bar, as shown, and extending continuously from end to end, except as interrupted by a series of pointed teeth 16 extending forwardly from the bar and spaced from each other longitudinally thereof, for penetrating the edge of the sheet to be fed and elevating the superposed sheets, as hereafter described.

Each tooth 16 is formed by opposite side and top and bottom surfaces converging to a point, as shown. The opposite side surfaces 17 and 18 preferably converge at equal angles of inclination with the feed shoulder 15, while the under or bottom surface 19 of the tooth lies in a plane spaced above and parallel with the bottom surface 20 of the feed bar. This under surface 19, containing the tooth point 21, is spaced above the bottom of the bar and the upper surface of the feed plate by a distance which is no greater than the minimum height or thickness of the edge of the board to be fed in a state of maximum crushing. In other words, the point of the tooth is disposed at such a distance above the feed plate that the point will always penetrate the sheet in or below the upper surface thereof, in any condition of crushing to which it is likely to be subjected, so as to engage only the lower sheet and pass under the next sheet above. This distance in the present embodiment, for example, is 0.040 of an inch.

The upper surface 22 of the tooth is inclined from its point upwardly and rearwardly to an intersection with the top surface of the bar in a line 23 spaced somewhat forwardly of the feed shoulder 15. In the present instance, this inclined upper face of the tooth makes an angle of 22° 30' with the horizontal and the line 23 is spaced forwardly of the feed shoulder by a distance of 0.022 of an inch.

A feed bar so constructed is shown in Fig. 2 as it approaches a corrugated board blank 24 of approximately the same height as the top of the feed bar. As the feed plate advances, as shown in Fig. 3, the point of the tooth penetrates the edge of the board intermediate its top and bot-

3

tom facing sheets, 25 and 26, respectively, while the edge of the board is engaged by the feed shoulder 15, so that the lower board only is fed forwardly from beneath the stack, as shown. If the edge of the board is presented in crushed condition, its upper surface will be level with or above the points 21 of the teeth of the feed bar, so that the tooth point will pass under the superposed board and cam it, together with the whole stack, upwardly to position to be cleared by the top of the feed bar.

The same feed bar is shown in Fig. 4 in position for feeding a blank 27 having a thickness or height substantially less than that of the feed bar but greater than the height of the point of the bar above the feed plate, so that when the feed bar is advanced, as shown in Fig. 5, the tooth again penetrates between the top and bottom liners of the lower blank only. The portion of the blank, however, immediately above the tooth, is cammed upwardly by its inclined upper face 22 and raises also the superposed blanks of the stack, so that as the lower blank only is advanced, the feed bar clears and passes under the superposed blank without feeding it. The blank is shown with a normal edge, but it is evident that if its edge were crushed to the maximum extent permitted by the thickness of its component materials, its top surface would still lie level with or above the point of the tooth, and the latter would penetrate and feed the lower blank only and pass under the superposed blank.

The disclosure herein of particular dimensions of the bar is intended in a merely illustrative way, as it is obvious that the same advantageous principles may be applied to a series of bars ranging in size in accordance with the thickness of the sheets to be fed. It is evident that the principles of construction herein disclosed provide a bar which can be made in the thickness required for strength and rigidity, while being adapted to feed blanks having an edge thickness substantially less than the thickness of the bar, the blanks being fed one at a time, in a reliable manner, so as to avoid interruption in the operation of the blank folding or other machine with which the feeder bar is associated.

It will thus be seen that the invention accomplishes its objects and while it has been herein disclosed by reference to the details of a preferred embodiment, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. A feeder bar adapted to be reciprocated for feeding sheets of corrugated cardboard and the like singly from the bottom of a stack thereof,

4

said bar having on the side thereof lying in the direction of feed an upright feeding shoulder for engagement with the edge of a bottom sheet to be fed and having at said shoulder a series of pointed teeth extending forwardly in the direction of feed and spaced longitudinally along said bar, the points of said teeth being arranged at a height intermediate the top and bottom of said bar and of said sheet to be fed and the upper surfaces of said teeth being inclined upwardly and rearwardly to a height at least equal to that of said shoulder for raising the superposed sheets to enable said bar to clear and pass under the same and thereby feed single sheets having a thickness equal to or less than that of said bar.

2. A feeder bar as specified in claim 1 in which said upper surfaces of said teeth are inclined upwardly and oppositely to the direction of feed to a height equal to that of said shoulder at a line spaced in advance of the line of said shoulder.

3. A feeder bar as specified in claim 2 in which the under surfaces of said teeth lie in a plane passing substantially through the points thereof and above and parallel with the bottom surface of said bar.

4. A feeder bar as specified in claim 3 in which said shoulder is substantially equal in height to the height of said bar.

5. A feed bar adapted to be reciprocated for feeding sheets of corrugated cardboard and the like singly from the bottom of a stack thereof, said bar having on the side thereof lying in the direction of feed a vertical feeding shoulder substantially equal in height to said bar for engagement with the edge of a bottom sheet to be fed and having a series of pointed teeth extending forwardly in the direction of feed from the upper portion of said shoulder and spaced from one another longitudinally of said bar, the points of said teeth being arranged at a height less than that of said bar and intermediate the top and bottom of said sheet to be fed, said teeth having their upper surfaces inclined upwardly and rearwardly to a height equal to that of said shoulder at a line spaced forwardly in advance of the forward line of said shoulder and having their under surfaces lying in a plane passing substantially through the points thereof and above and parallel with the bottom surface of said bar.

WILBER E. BOWERSOCK.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
551,463	Crowell	Dec. 17, 1895
1,150,210	Langston	Aug. 17, 1915
1,592,367	Hren et al.	July 13, 1926
2,158,505	Horgan	May 16, 1939