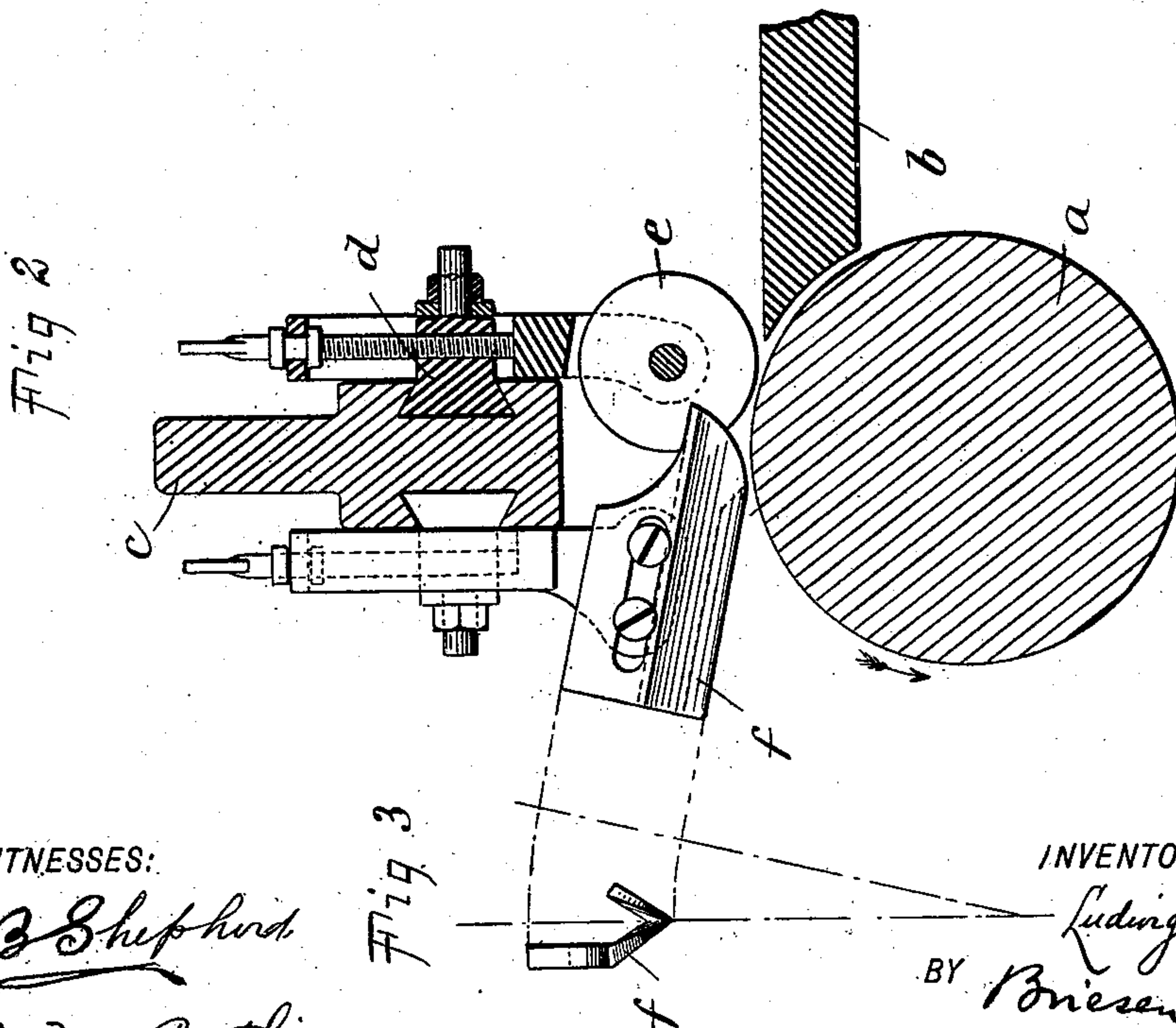
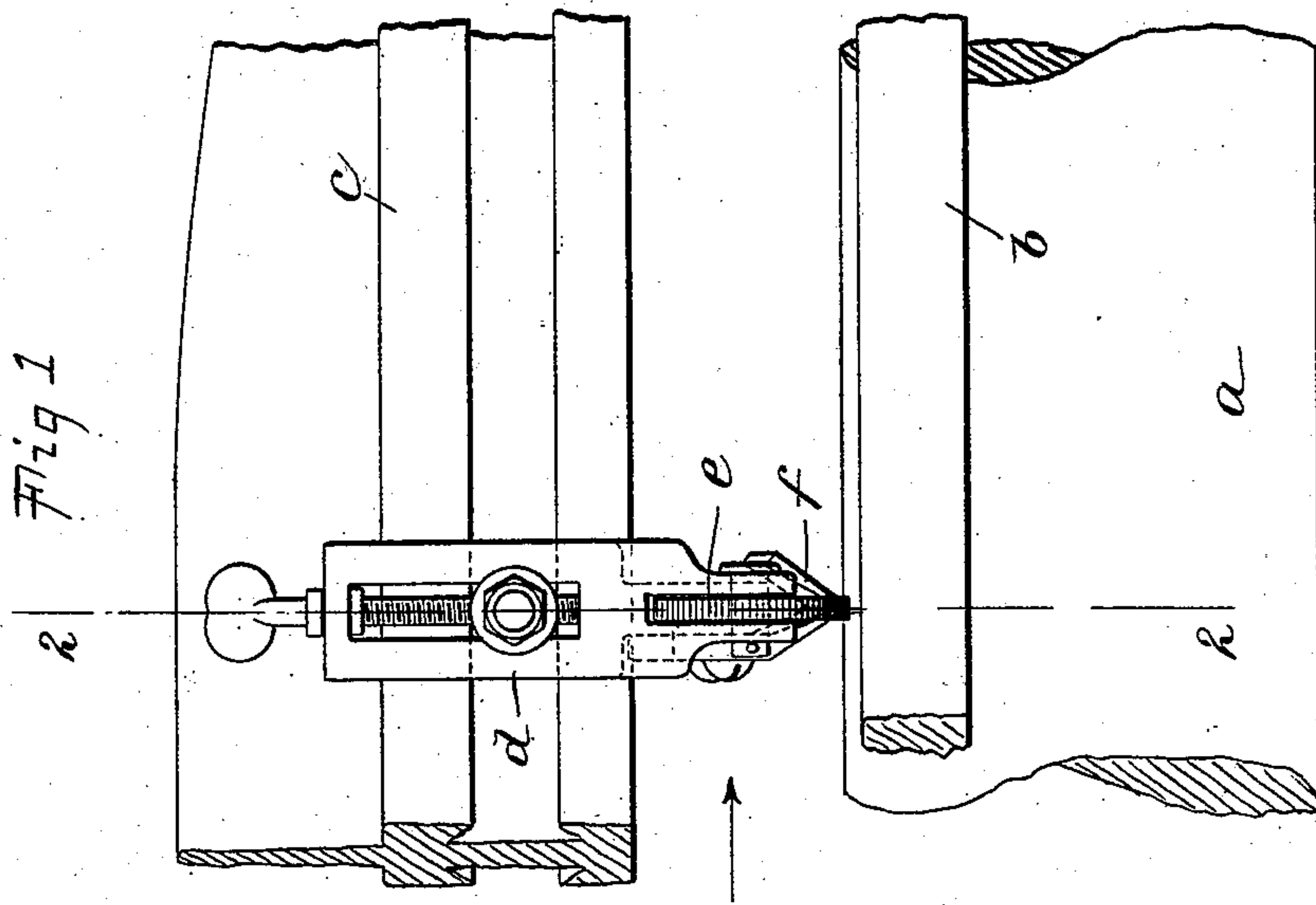


(No Model.)

L. NICOLAI.
CARDBOARD GROOVING MACHINE.

No. 534,000.

Patented Feb. 12, 1895.



WITNESSES:
Robt Shepherd
Charles M. Catlin.

Fig 3

INVENTOR
Ludwig Nicolai.
BY *Briesen & Knauth*
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

LUDWIG NICOLAI, OF DRESDEN, GERMANY.

CARDBOARD-GROOVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 534,000, dated February 12, 1895.

Application filed March 10, 1893. Serial No. 465,377. (No model.)

To all whom it may concern:

Be it known that I, LUDWIG NICOLAI, of Dresden, Germany, have invented an Improvement in Cardboard-Grooving Machines, of which the following is a specification.

My present invention relates to cardboard grooving machines, and the invention consists, mainly, in an improved arrangement of the pressure feed roll or rolls in relation to the knife or knives, as hereinafter described.

Cardboard grooving or scoring machines have heretofore had pressure rolls to assist in feeding the cardboard, but these rolls have been placed at some distance from and at each side of the knives. The shapes of the knives and rollers used were not such as to allow any other arrangement. My construction of knife is shown in Patent No. 442,738, dated December 16, 1890. The old disposition of rolls is not an entirely practical one, as the pairs of rolls and the knife or knives between them do not act on the card-board in the same line (in the direction in which the card-board is fed through the machine) but in several independent lines. Objectionable results follow, especially when thin or medium card-board, or board of inferior quality is being scored or grooved, because it does not of itself possess enough strength to carry it past the grooving knife untorn.

The present invention obviates the trouble above mentioned. In my improved construction each bifurcated knife is provided with a roll in close proximity to its lower main cutting edge preferably in the same longitudinal line therewith. The rolls are quite narrow and can therefore be set in the transverse supporting beam in such manner that they work between the double blades of the bifurcated forward end of the knives, as shown in the drawings, in which—

Figure 1 is a front view of a portion of a card-board grooving machine having the improvement embodied therein. Fig. 2 is a sectional view on line 2, 2 of Fig. 1, the knife and its carrier, however, being left in elevation. Fig. 3 is a front view of the knife.

In the drawings *a* is a feed roller, which can be driven by any suitable power; *b*, a table on which the paste-board to be grooved is laid.

c is a beam with two dovetail grooves in

which may be fitted one or more holders *d* for one or more pressure rolls *e*, there being, preferably one for each knife *f*, although additional rollers may be used at a distance on each side of the knife or knives, if desired. The knife, or knives, may be supported at the back of the beam *c*, in the same manner as such roll is in front.

As shown, the pressure roll in the improved construction is located between the two blades of the bifurcated point of the knife, and its periphery, preferably milled, presses down on the pasteboard in advance of the cutting edges. This enables the pasteboard to be fed along without being torn, since it does not bring the largest strain caused by feeding along the pasteboard off at a distance from the line of resistance caused by the knife, but directly in a line therewith.

Evidently, other means than those shown can be used for supporting the knives and rolls, without departing from the invention. The knives are preferably adjustable laterally through the medium of the holders, *d*, on the beam *c*, and also have an angular adjustment at their point of attachment with the lower end of the said holders *d*.

The pressure roll *e* may, if desired, be placed at such a distance in advance of the knife, *f*, that its circumference will be without the lines of the forward ends of the knife and thus not between the bifurcated ends. It may also be placed, if desired, to one side of the knife in close proximity to the outer side of the bifurcated end, the line of resistance being still substantially in the plane of roll *e* though the preferable construction is that illustrated in the drawings.

What I claim is—

1. In a pasteboard grooving machine the combination of one or more scoring or grooving knives, and a pressure feed idler roll *e* for each knife, adapted to bear on the pasteboard in front of its knife and to be rotated by contact with the pasteboard, substantially as described.

2. In a pasteboard grooving machine the combination of one or more scoring or grooving knives, having bifurcated ends, and a pressure feed idler roll *e* for each knife, adapted to bear on the pasteboard in front of its knife and between the sides of the bifur-

cated ends and adapted to be rotated by contact with the pasteboard, substantially as described.

3. In a pasteboard grooving machine the
5 combination of one or more scoring or grooving knives having the forward ends bifurcated, a narrow vertically disposed pressure feed idler roll provided in advance of the
10 lowermost straight blade of each knife at or near the line of its length, substantially as described.

4. In a pasteboard grooving machine the combination of one or more V-shaped scoring or grooving knives having bifurcated ends,
15 each knife adjustably secured above the table of the machine, a pressure feed idler roll journaled to the frame of the machine in advance of the lower cutting blade of the V-

shaped knife and mechanism for feeding the pasteboard beneath the pressure roll to the
20 knives, substantially as described.

5. In a paste-board grooving machine the combination of one or more scoring or grooving knives *f*, adjustably secured to the frame of the machine having curved forward bi-
25 furcated ends, a pressure feed idler roller *e*, provided between the two bifurcated blades of the forward end of each knife journaled upon the frame of the machine, table *b* and feeding mechanism *a* provided below said
30 pressure roller and knife, substantially as described.

LUDWIG NICOLAI.

Witnesses:

CHARLES M. CATLIN,
HARRY M. TURK.