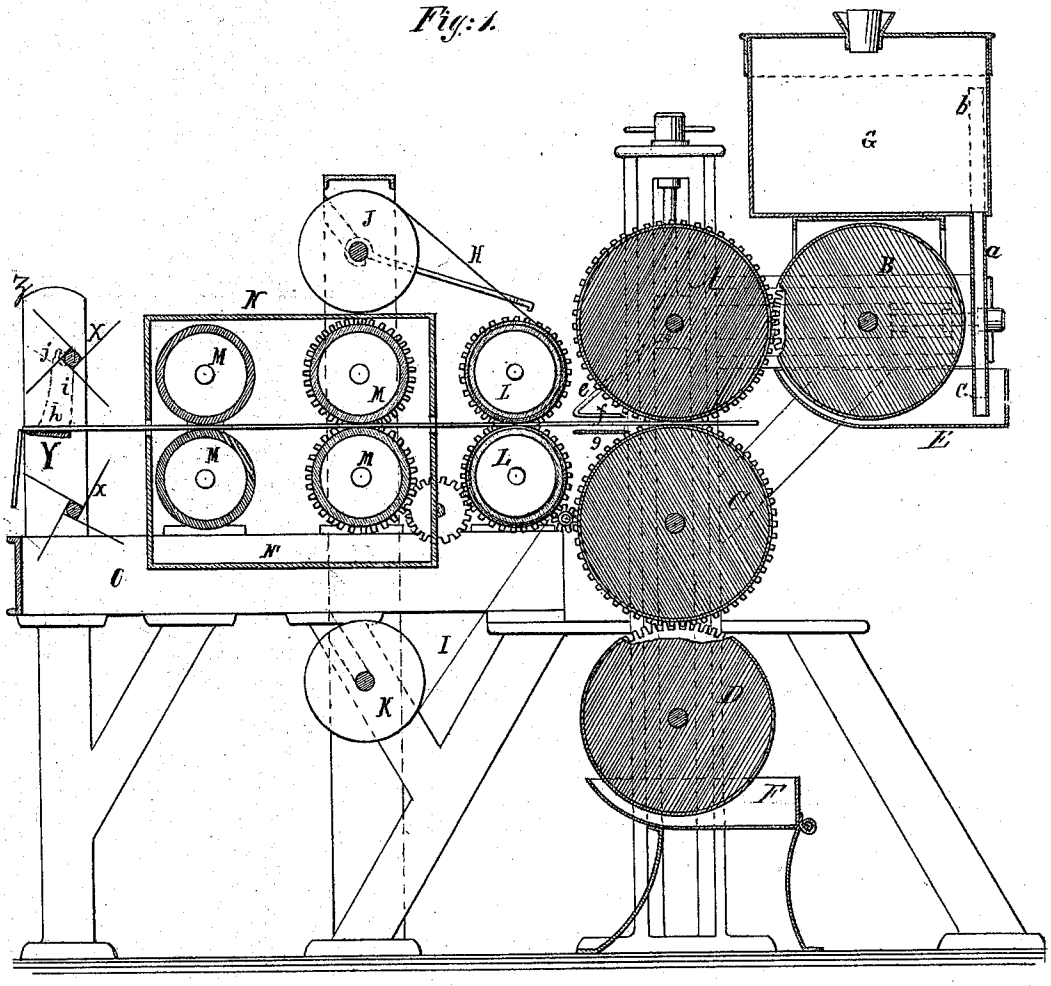
2 Sheets. Sheet 1.

G. L. Saeger,
Lining Paper.

No. 102,942. Patented. May. 10. 1870.

Fig: 1.



Witnesses
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E. F. Kastenhuber

Inventor:
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his attys

2 Sheets. Sheet. 2.

G. L. Jaeger,

Lining Paper.

No. 102942. Patented. May. 10. 1870.

Fig: 2.

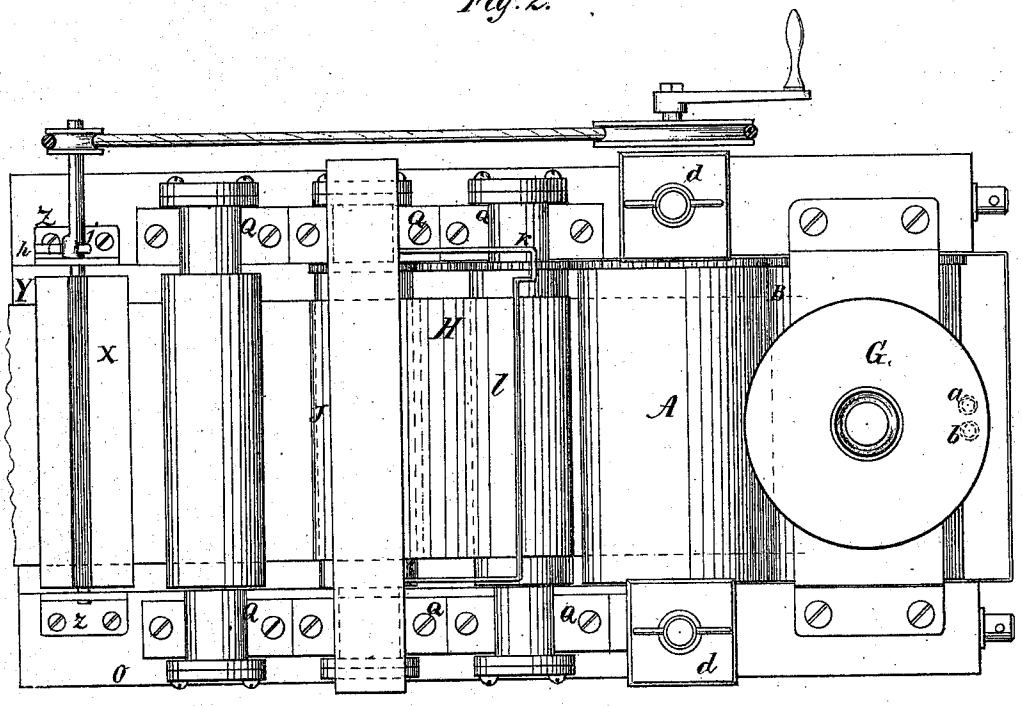
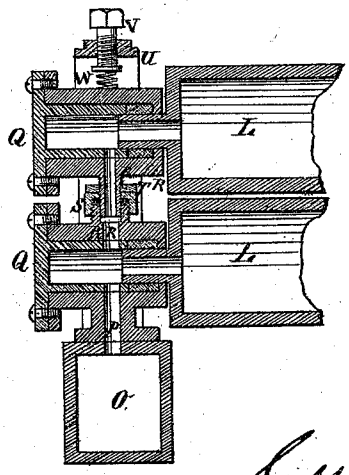


Fig: 3.



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UNITED STATES PATENT OFFICE.

GUSTAV L. JAEGER, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR LINING AND DRYING PASTEBOARD, &c.

Specification forming part of Letters Patent No. **102,942**, dated May 10, 1870.

To all whom it may concern:

Be it known that I, GUSTAV L. JAEGER, of the city, county, and State of New York, have invented a new and Improved Machine for Lining and Drying Pasteboards and other Materials; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 represents a longitudinal vertical section of this invention. Fig. 2 is a plan or top view of the same, partly in section. Fig. 3 is a detached section of one of the steam-boxes of the drying-rollers.

Similar letters indicate corresponding parts.

This invention relates to a machine composed of two sets of pasting-rollers, through which the pasteboards are fed in succession, in combination with a drying apparatus, and with two rolls of paper, in such a manner that the pasteboards, on passing through between the pasting-rollers, are supplied with paste on both sides, and the paper for lining, being taken from the continuous rolls, is then applied simultaneously from both sides, and the pasteboards, after having been lined, are made to pass through between a series of pressing and drying rollers, thereby effecting the operation of lining and drying the pasteboards with little trouble or expense.

The paste is supplied from an air-tight reservoir, connecting with the trough through siphon-tubes, whereby a uniform supply of paste is insured. Suitable stationary fingers bearing on the inner pasting-rollers prevent the pasteboard from adhering to and being carried round by said pasting-rollers.

The hollow drying-rollers are heated by steam introduced therein through steam-boxes, constructed so as to allow said rollers to adjust themselves to the varying thickness of the pasteboards. Said drying-rollers are covered up by a heating-chamber to enable them to retain the heat.

On leaving the drying apparatus, the lined pasteboards are exposed to the action of fans, which serve to carry off the moisture. On passing out of the drying apparatus, the lined pasteboards are exposed to the action of a knife, which cuts the lining and leaves the dried pasteboards in sheets ready for use.

In the drawing, the letters A B C D represent two sets of pasting-rollers, which are supplied with paste—one set from the trough E, and the other from the trough F—the paste being fed into each of said troughs from an air-tight reservoir, G, (one such reservoir being shown in the drawing,) which is provided with a feed-pipe, *a*, extending from its bottom near to the bottom of its trough, and with an air-pipe, *b*, open at both ends, extending through the bottom of the reservoir and nearly to its top, and down into the trough to the desired level of the paste. If the paste rises in the trough up to this level, it stops up the mouth *c* of the air-pipe, through which alone air is admitted into the reservoir, and the flow of the paste through this pipe *a* ceases. By these means a uniform level of paste is insured in the troughs, which is very essential for the success of the operation.

The rollers B and D dip into the troughs E and F, and as they revolve they take up a quantity of the paste and transfer it to the rollers A and C, which run close together, so that they transfer the paste to the pasteboards, which are fed through between them in close succession.

All the pasting-rollers are covered with felt or other absorbent material capable of taking up and retaining the paste.

The rollers A, B, and D have their bearings in adjustable boxes, so that the several rollers can be set up as close as may be required, and to the boxes *d* of the roller A is secured a yoke, *e*, the horizontal cross-bar of which extends parallel to the axis of said roller, and is provided with clearing-fingers *f*, extending clear up to the circumference of the roller, so that the pasteboards, in passing through between the rollers A and C, are prevented from being carried round and round by the roller A, a similar set of fingers, *g*, being combined with the roller C for the same purpose. The object of attaching the yoke *e* to the adjustable boxes *d* is to compel the fingers *f* to retain their proper relation toward the circumference of

the roller A if said roller is moved up or down. The fingers *g* of the roller C are stationary, since this roller requires no adjustment.

After having passed through the pasting-rollers the pasteboards are carried through between the sheets of paper H I, which are taken from rolls J K and caused to pass through between the first pair of hollow pressing and drying rollers L, so that said sheets of paper are pressed from opposite sides against the surfaces of the pasteboard.

The pressing, and also the drying, rollers are geared together with each other and with the pasting-rollers, so that they revolve with the same circumferential velocity, and said pressing-rollers are covered with felt or other suitable material, so as to enable them to produce a uniform yielding pressure upon the materials passing through between them.

After the combined pasteboards and the linings have passed through the pressing-rollers L, they pass through a series of hollow drying-rollers, M, provided with hard surfaces, by which they are properly calendered and their surfaces finished. The series of rollers M are inclosed in a chamber for the purpose of preventing the loss of heat, such chamber being made in sections N N′, the lower section, N′, being fixed to the frame of the machine, and the upper one, N, being loose, and arranged so as to inclose the rollers M and their steam-boxes Q, the edges of the section N being supported on the frame-work of the machine before and behind the rollers M. The sections N N′ of the chamber close upon each other with close joints at all points except along the front and rear sides in the plane of the contact of the pressing and drying rollers, where they are separated sufficiently to allow the pasteboards to pass in and out without being obstructed. The hollow pressing-rollers and calendering-rollers L M are heated by steam, which is conducted from any suitable steam-generator through the hollow beams O O of the frame of the machine, whence it passes through pipes P into steam-boxes Q, whose inner sides form bearings for the ends of the shafts of said rollers L M, which shafts must be hollow, so as to allow the steam to pass into the rollers from the steam-boxes. The steam-boxes Q of each pair of rollers L M are connected to each other by adjustable telescopic tubes R, that fit into each other, with packed joints through the medium of packing-boxes S, the adjustment, so as to bring the rollers in proper relations to each other, being effected by nuts T, that turn on screw-threads formed upon the male tube R of the joint, and rest upon the top of the packing-boxes S, in such a manner that, by turning the nuts T up or down, the male tubes R are raised or lowered, and the rollers of each pair are thereby adjusted to each other, respectively.

The upper rollers of each pair are held down upon the lower rollers with a yielding pressure in the following manner: The steam-boxes Q of each pair or set of rollers (which boxes contain the bearings for said rollers, as above explained) are confined within a metal frame, U, whose ends are confined to the machine by the heads of the same screws which fasten the steam-boxes thereto.

The top of each frame U is provided with a screw, V, working in a female screw-thread formed in the top of the frame, and the end of the screw bears upon a spring or spring-plate, W, secured to the upper part of the steam-box; or, if preferred, the spring or spring-plate W may be secured in the interior of the head of the frame, so that the boxes will be held down, and consequently the rollers, with a yielding pressure, which will allow them to separate and adjust themselves to any inequality of the materials which are passing through them.

As the pasteboards leave the last pair of the series of drying-rollers M they pass out of the hot-air chamber N N′ and enter between a pair of revolving fans, X X, which are turned by belts from the main or other convenient shaft of the machine, being driven at a high speed, so as to drive off the moisture from the boards.

Between said fans, and arranged at a distance from the last pair of rollers less than the width of a sheet of pasteboard, and a little lower than the top of the lower roller of the pair, I place a horizontal knife, Y, whose ends extend through slots in the standards Z Z, which support the shafts of the fans where they are pivoted to the lower arms of levers *h h*, which vibrate on pivots *i i*, the upper arms of said levers being arranged to embrace eccentrics *j j*, formed on the shaft of the upper fan, in such a manner that the rotation of said shaft causes a rapid vibration of the levers, whereby the knife Y is moved outward and inward in the same horizontal plane with great rapidity, for the purpose of separating the sheets of pasteboards and cutting the linings, which, being continuous, join the several pieces of pasteboards at their edges, and serve to draw them one after the other through the machine, and insure their progress and delivery at its end. The outer edge of the knife Y extends beyond the fan-shafts, and the sheets are held by the flat surface of the knife in a horizontal position, favorable to the action of the fans, until the sheets are advanced more than half-way over the knife, when they tilt and hang down by the web of lining which connects them to each other over the outer edge of the knife, whose rapid reciprocation inward and outward facilitates the outward progress of the sheets of pasteboard, and severs them from each other by cutting and knocking off the sheet which has tilted and hangs down over the knife, cutting and tearing the web of lining which connects it with the succeeding sheet.

The stop-motion consists of a finger, *k*, and arm *l*, connected to each other, and which are arranged to vibrate on the axis or beam of the roll of lining, so as to be held up by the lining as it extends from the roll to the place where it is fed in between the pressing-rollers. The arm *l* extends across and rests upon the lining, and when the lining is broken the arm and finger fall and operate the belt-shipper or a signal to the attendant; or, as in this example, the finger *k* may be arranged to come in contact with one of the gear-wheels of the machine. Each roll of lining is provided with a stop-motion, as above described.

My invention can also be used for lining card-board with paper, and in this case the card-board is fed in from a continuous roll, and the knife I have above described is, by disconnecting it from the fan-shafts, changed into a stationary platform between the fans, which supports the board in a horizontal position as it passes between the fans.

When the pasteboard sheets or the card-board are to be lined only on one side, two such sheets, or two layers of card-board, are made to pass through the machine, one being placed on top of the other, so that each sheet is supplied with paste and lined only on one side.

The drying-rollers can be heated with gas instead of steam, if preferred.

I do not wish to restrict myself to separating the several sheets of pasteboard and severing their connecting-webs as they pass over the reciprocating knife, as by converting the knife into a stationary table or platform, as above described, I can cause the sheets to pass from the machine in a connected series, and in that condition hang them up by their webs upon a suitable drying-frame, and separate them after they have become dry.

The hot-air chamber N N′ can be used also with cold rollers, and hot air or steam can be introduced only into the chamber for the purpose of heating and drying the materials as they pass between the rollers.

What I claim as new, and desire to secure by Letters Patent, is—

1. The heating-chambers N N′, inclosing the rollers M M, provided with journal-bearings, constructed and operating substantially as herein shown and described.

2. Air-tight paste-reservoirs, connected by air-pipes *b* to the paste-troughs, substantially as described, to regulate the supply of paste to the troughs.

3. The arm *l*, with or without the finger *k*, in combination with the continuous lining, and so arranged as to be supported thereby while the lining remains extended, and to fall when the continuity of the lining is broken, substantially as described.

4. The steam-boxes Q, connected by telescopic adjusting-tubes, substantially as described, in combination with the pressing and drying rollers.

5. The journaled yoke *e*, carrying the fingers *f*, when combined with the fingers *g*, both constructed and operating together in relation to the rollers A and C, substantially as herein shown and described.

6. Connecting the fingers *f* with the boxes of the roller A, so that they are raised or lowered with said roller in the adjustment of said boxes, substantially as described.

7. The combination and arrangement of the pasting-rollers A C, the pressing and drying rollers L M, and the paste reservoir G with continuous rolls of lining-paper J K, substantially as described.

8. The reciprocating knife Y, moving in a horizontal plane, arranged substantially as described, so as to cut the continuous linings that connect the sheets of pasteboard.

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Witnesses:

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