March 31, 1953 O. KLABUNDE 2,632,975

DRAFTING DEVICE

Filed Feb. 24, 1951 2 SHEETS—SHEET 1

Fig. 1.

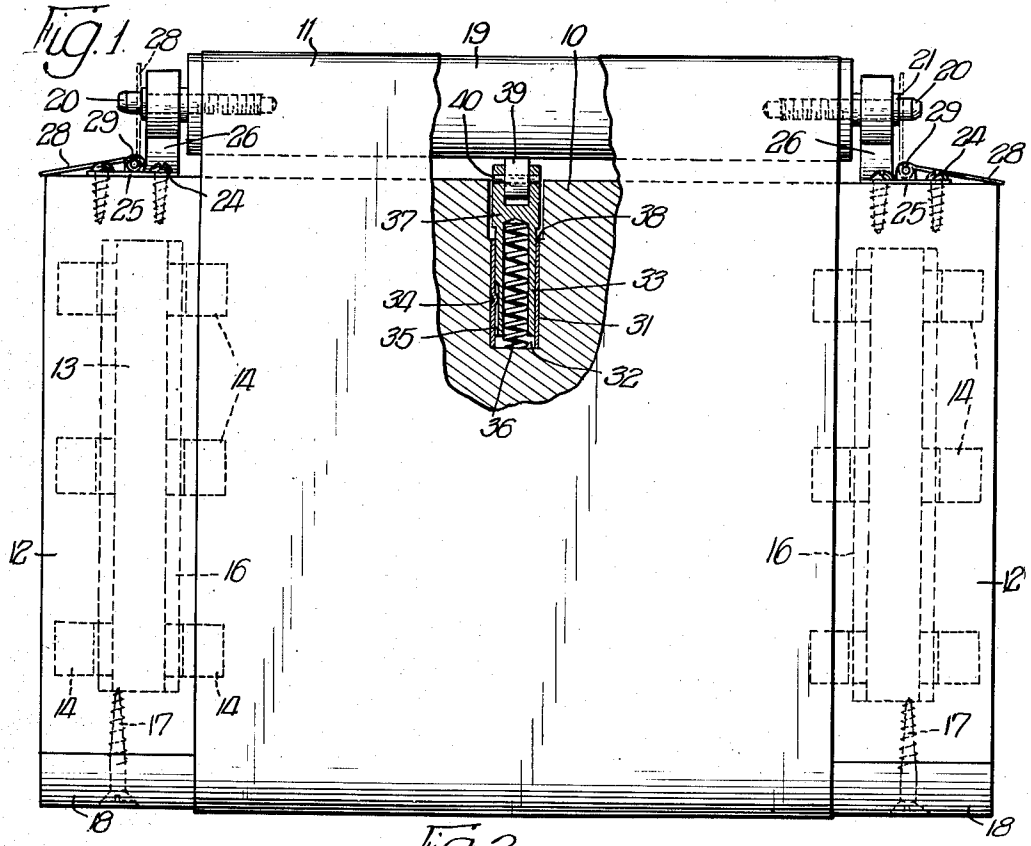


Fig. 2.

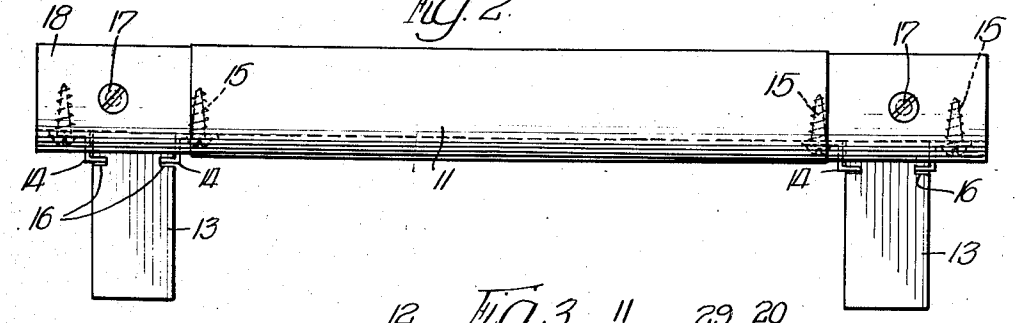
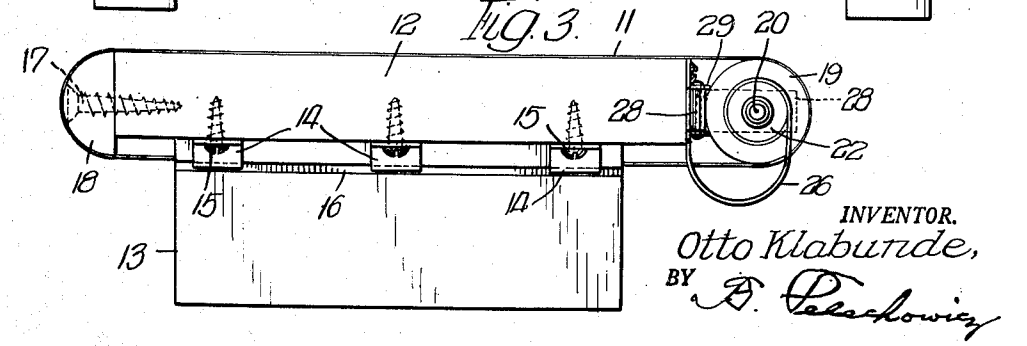


Fig. 3.



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Fig. 4

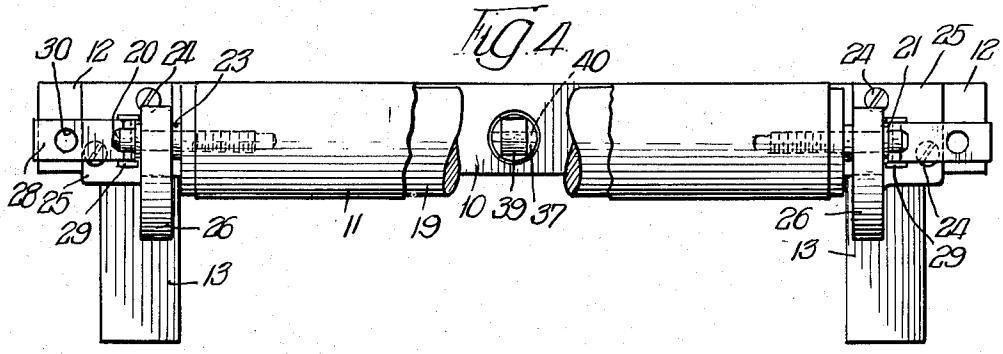


Fig. 5

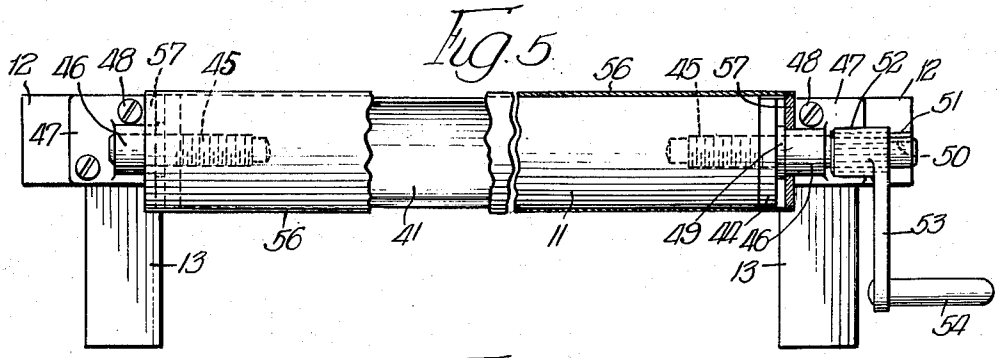


Fig. 6

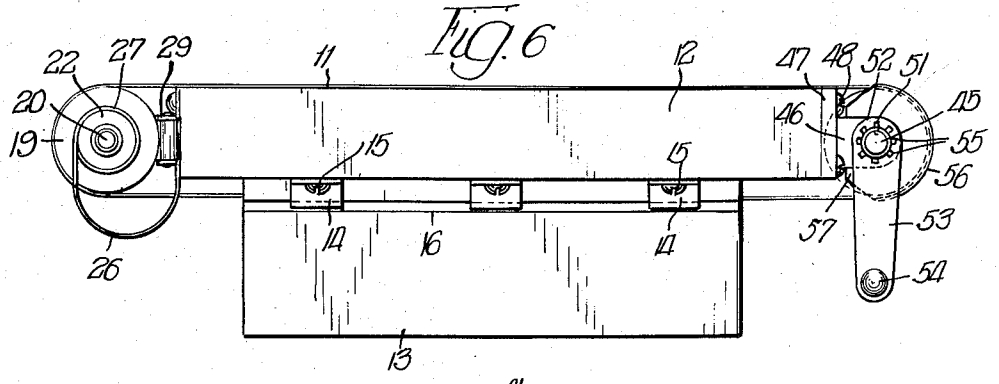
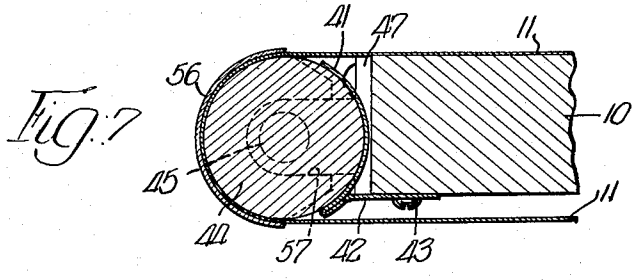


Fig. 7



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DRAFTING DEVICE

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4 Claims. (Cl. 45—131)

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The present invention relates to drafting devices, and has for its main object the provision of a board for receiving in an encompassing relation an endless drawing paper.

A further object of the present invention is the provision of means in a drawing board whereby an endless paper sheet may be held in a taut relation with a board.

Another object of the present invention is the provision in association with one edge of a drawing board of a roller held under a yielding tension to or away from the board, so that when an endless sheet of paper is passed around the board and over the said roller, the latter, normally under a pressure away from the board, may maintain the sheet in a stretched relation with the board, said roller being capable of manual depression towards the board for the purpose of slackening the endless paper sheet so that the latter may be shifted around the board.

Another object of the present invention is the provision of a suitable mechanical means whereby the endless paper sheet may be shifted around the board.

A still further object of the present invention is the provision of a suitable removable guard at one edge of the board for guarding an endless paper sheet therearound against scratching or soiling.

With the above general objects in view and others that will appear as the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings forming a part of this application and in which like designating characters refer to corresponding parts throughout the several views:

Fig. 1 is a top elevational view, partly in section, with an endless paper sheet in an operative position therewith;

Fig. 2 is an end elevational view of the board, along the front or near edge thereof;

Fig. 3 is a side elevational view of the board, on a reduced scale;

Fig. 4 is an end elevational view of the board, partly in section, along the rear or far edge thereof;

Fig. 5 is a near end elevational view of the board, with a mechanism cooperating with that end for shifting the endless paper sheet around the board;

Fig. 6 is a side elevational view of the board, including the end view of the mechanism shown in Fig. 5 for mechanically shifting the paper sheet around the board; and

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Fig. 7 is a transverse cross sectional view through the mechanism for mechanically shifting an endless paper sheet around the board, with a cross section of a guard overlying the paper sheet adjacent the front end of the board.

Referring to the present drawing in detail there is shown therein board 10, adapted to receive in an encompassing relation an endless sheet of paper 11. Said paper sheet 11 is narrower than the width of board 10, so that the side edges of board 10 extend beyond the side edges of paper sheet 11. For the sake of clearness said side edges of board 10 will be referred to as wings 12, notwithstanding the fact that said wings 12 are integral parts of the board and homogeneous therewith.

Supporting cleat 13 downwardly depends from each wing 12, and is held in position therewith by means of a plurality of Z-shaped clamping members 14, the upper ends of which are affixed to board 10 or its wings 12 by means of screws 15. A number of said clamping members 14 are disposed upon one face of each cleat 13, while an equal number thereof is disposed adjacent the opposite face of each cleat 13. The lower ends of said clamping members 14 enter longitudinal recesses 16 along each face of cleat 13. By virtue of this arrangement cleats 13 may be shifted either towards the front or the rear end of board 10.

Affixed to the front or near end of board 10, including wings 12, by means of screws 17, is an edge piece 18, segmental on a transverse cross section, with its arcuate face disposed outwardly. While the upper edge of said edge piece 18 remains flush with the upper face of board 10, including wings 12, the lower edge thereof remains in a spaced relation with the lower face of the board and wings 12, as is clearly seen in Fig. 3, for the purpose hereinafter specified.

Adjacent the rear or farther end of board 10 roller 19 is positioned in a spaced relation with board 10. Said roller 19 may be slightly longer than the width of paper sheet 11. Its ends do not extend across wings 12. The upper edge of said roller 19 remains on the upper plane of board 10, while the diametrically opposite portion of the roller's periphery extends below the lower plane of said board 10. By virtue of this arrangement said roller 19, in cooperation with the downwardly extending edge of edge piece 18 maintains the lower portion of paper sheet 11 in

a spaced relation with the lower face of board 10, while the upper portion of the endless paper sheet 11 remains in contact with the upper face of said board 10, as is clearly seen in Fig. 3. It is of course only the upper portion of the endless paper sheet 11, which remains in contact with board 10, which is to receive sketching or drawing impressions.

Each of the ends of roller 19 carries shaft 20 in a concentric relation with the said roller. The inner end of said shaft 20 may be threaded whereby said shaft may be driven into the roller. Integrally formed with each shaft 20 is collar 21, which is in a spaced relation with the outer termination of said shaft 20. Loosely positioned upon shaft 20 is wheel or bearing 22, for which collar 21 acts as a stop from one outer face thereof. Loosely positioned upon said shaft 20 and interposed between the end of roller 19, and the adjacent inner face of wheel 22 is an annular spacer 23. By virtue of this arrangement wheel 22 is capable of rotary movement around shaft 20, but is incapable of longitudinal shifting movement in relation therewith.

Affixed by means of screws 24 to the rear end of each wing 12 is plate 25. Either integrally formed with said plate 25, or rigidly affixed thereto, either by soldering or otherwise, is leaf spring 26, of a generally U-shaped formation, the bight of which extends downwardly and beyond the lower face of board 10 and wings 12, as is best seen in Fig. 6. The opposite end of said spring 26 terminates in an inwardly wound coil 27, which encompasses and rigidly engages wheel 22.

From the hereinabove description it will be noted that roller 19 is supported and held in an operative position with relation to board 10 only by means of a pair of springs 26, one coacting with each end of said roller 19. Normally, said springs 26 tend to urge said roller 19 away from the adjacent end, that is rear or far end, of board 10, for the purpose of maintaining the endless paper sheet 11 in a stretched and taut condition with relation to board 10, when said paper sheet 11 is passed over said edge piece 18 and said roller 19.

The parts already described render the invention essentially operative. To make endless paper sheet 11, a longitudinal strip of paper is passed over edge piece 18 and roller 19, and thereupon the ends of a paper strip are joined by a Scotch tape or any other means. Before the ends of the paper strip are joined it is advisable to manually depress roller 19 toward board 10, against the tension of springs 26, in order to eliminate any slack in the endless paper sheet which is ultimately to be formed. When the ends of a paper strip have been joined, the manual pressure against roller 19 is eliminated, and springs 26, tending to press away from board 10, exert pressure upon the formed endless paper sheet in order to maintain the latter in a stretched and taut condition with relation to board 10.

Rather than to use manual operation for depressing roller 19 for the purpose described in the last preceding paragraph, suitable mechanical means is provided for the purpose of maintaining roller 19 shifted towards the adjacent end of board 10 while a paper endless sheet is being prepared around the drawing board. That means includes arm 28, hingedly connected to each plate 25 at lugs 29 extending from each of said plates 25. The opposite free end of each arm 28 is provided with opening 30. When said arms 28 are raised into a vertical position with relation to plates 25, the free ends of shafts 20 are not in alinement with openings 30, but are farther removed therefrom towards the ends of arms 28, due to the action of springs 26. When however roller 19 is manually pressed towards the adjacent end of board 10 the free ends of shafts 20 will eventually come into an alinement with openings 30, provided that arms 28 are held substantially in a vertical position with relation to plates 25. When the free ends of said shafts 20 come in alinement with said openings 30 arms 28 are then swung towards said shafts 20, until the shafts enter said openings 30, the position indicated by dotted lines in Fig. 1. When in that position shafts 20 and through them roller 19 are effectively locked to said arms 28, rendering springs 26 inoperative, thereby bringing about a position of roller 19 which is rigid relative to board 10. When in that position of roller 19 with relation to board 10, a strip of paper is passed over edge piece 18 and said roller 19, and the ends of the paper strip are joined for effecting an endless paper sheet 11 around board 10, as is clearly seen in Figs. 1, 3 and 6. It is noted that the paper sheet formed around the board by the operation last hereinabove described is reasonably stretched and taut with relation to board 10, edge piece 18 and roller 19. When however arms 28 are swung into their inoperative position, that is away from their engagement with shafts 20, the full lines position illustrated in Fig. 1, roller 19 is then free to shift away from the adjacent end of board 10 due to the actions of springs 26, thereby removing any slack that might have existed in the endless paper sheet 11 after it was formed around board 10.

Manual depression of roller 19, as well as the pressure exerted thereagainst by the endless paper sheet 11, may eventually cause said roller 19 to assume a bent formation. To guard against this suitable mechanism is provided whereby the roller may be pressed at all times away from the adjacent end of board 10. This means, best shown in Fig. 1, includes cylindrical tube 31 frictionally held within bore 32 made within the end of board 10, which is adjacent to roller 19. Cylindrical hollow plunger 33 is positioned within tube 31 for longitudinal movement therewithin. Tube 31 is provided with an inwardly extending indent 34 which enters key-way 35 made upon the periphery of plunger 33 in a longitudinal direction, said key-way being open upon the inner end of said plunger 33. By virtue of this arrangement plunger 33 may readily be inserted within tube 31 with indent 34 made to enter key-way 35. It is clear that indent 34 permits longitudinal shifting movement of plunger 33 within tube 31, but prevents rotary movement of said plunger 33 within said tube 31. Coil spring 36 is extended within the cavity of plunger 33, to bear against the bottom of bore 32 in order to normally tend to shift said plunger 33 out of tube 31. Integrally formed with said plunger 33 is an enlarged head 37, said bore 32 at its outer end being enlarged in order to accommodate therewithin said head 37. The enlarged portion of bore 32 affects shoulder 38, with which the adjacent end of tube 31 terminates, and which forms a stop for head 37, preventing its further inward shifting. At the outer end head 37 carries wheel 39, journalled upon pin 40 for rotary movement.

Coil spring 36 urges wheel 39 in contact with roller 19 and exerts pressure thereon tending to urge said roller 19 away from the adjacent end

of board 10. By virtue of this arrangement deformation of roller 19 is prevented which otherwise might ensue due to repeated manual shifting of roller 19 toward board 10, as well as due to the constant pressure thereagainst by the endless paper sheet 11. If roller 19 is unduly long the same may require a plurality of the counter-pressure devices including plunger 33, head 37 and wheel 39.

It is further observed that due to the fact that wheels 22 are loosely positioned upon shafts 20, roller 19 is capable of rotary movement without interference from said wheels 22 or springs 26. As the drawing upon the endless paper sheet 11 progresses from the rear or far end of board 10 toward the near or front end thereof, the endless paper sheet may readily be shifted around the board by merely exerting pressure by fingers upon the upper portion of the paper sheet and shifting the paper sheet upon the upper face of board 10. This operation will of course shift the endless paper sheet 11 around said board 10 as well as over said edge piece 18 and roller 19.

If however the paper sheet is unduly long it may then be desirable to shift the paper sheet around the board by mechanical means. Such means, best illustrated in Figs. 5, 6 and 7, includes arcuate channelled strip 41, positioned forwardly of the front edge of board 10. Said strip 41 has an integrally formed extension 42, projecting from the lower edge thereof. Said extension 42 overlies the lower face of board 10, adjacent its front end, and is there affixed by means of screws 43. It is understood that strip 41 and extension 42 may be made in a plurality of pieces spaced lengthwise of roller 44.

Roller 44 is positioned within the cradle of said strip 41, for a free rotary movement therewithin. Said roller 44 is mounted upon shafts 45, which are in a rigid, concentric relation with said roller 44. Each shaft 45 is freely journalled within bearing 46, which is integrally formed with and extending from plate 47. Each plate 47 is affixed, by means of screws 48 to the front end of each wing 12. Integrally formed with each shaft 45 is a spacing collar 49 which is normally interposed between the adjacent bearing 46 and the end of roller 44. By this means roller 44 is prevented from longitudinal shifting movement.

One shaft 45 is extended slightly beyond the outer side face of one wing 12 and is provided with a longitudinal keyway 50, within the outer end of which a comparatively short key 51 is inserted and there rigidly held. Freely rotatable upon the portion of that shaft 45, which remains between said key 51 and bearing 46, is collar 52, with the outer end of which crank 53 is integrally formed and radially projects therefrom. Handle 54 connects with the opposite end of said crank 53.

Collar 52 on its inner periphery is provided with a plurality of radially extending slots 55, as is seen in Fig. 6. When said collar 52 remains shifted towards the adjacent bearing 46, the same remains out of engagement with key 51, because the latter does not extend within any one of slots 55. In that position crank handle 53—54 remains inoperative and roller 44 may rotatably shift with both of its shafts 45, without in any manner affecting collar 52 or its crank handle. The latter simply hangs down, as seen in Fig. 5.

Thus, endless paper sheet 11 may be manually shifted upon board 10 and around and with rollers 19 and 44 without affecting collar 52 and its crank handle.

When however it is desirable to use the crank handle, collar 52 is longitudinally shifted away from bearing 46, with key 51 entering one of said slots 55, until crank 53 is well past the plane co-extensive with the side face of the adjacent wing 12. This will permit turning of the crank handle without interference from wing 12. This in turn will impart a rotary shifting movement to shaft 45 which carries said collar 52, and this in turn will cause rotatable shifting movement of roller 44. The rotation of roller 44 will necessarily cause the shifting movement of the endless paper sheet 11.

The portion of the endless paper sheet 11 stretched over either said edge piece 18 or roller 44, as the case may be, may become soiled or scratched when in contact with a draftsman's hands or clothing, particularly when the endless paper sheet 11 has been worked upon for a comparatively long time without frequent shifting. To guard against soiling or scratching of that portion of the endless paper sheet 11, a suitable guard therefor is provided. The same includes an arcuate, trough-like member 56, which in its operative position overlies and remains in contact with the endless paper sheet 11 stretched over roller 44 or edge piece 18, as the case may be, as is best seen in Fig. 7. Integrally formed with each end of said member 56 is substantially U-shaped wall 57, each of which is adapted to frictionally grasp the adjacent bearing 46 in a clamping relation, as is seen in Fig. 6. From this construction it will be readily seen that guard 56 easily snaps on and off from roller 44 or edge piece 18, as the case may be, and thereby effectively shields the portion of the endless paper sheet 11 overlying said roller 44 or edge piece 18, as the case may be.

Only slight modification of said guard 56 in order to adapt the same for use in connection with edge piece 18 need be had. All that is required is the elimination of walls 57 at the end of member 56, and making said member 56 resilient to snap on or off said edge piece 18.

It is to be understood that endless sheet of paper 11 may have under it an endless wing or apron which would of course shift with said endless sheet of paper 11.

While there is described herein a preferred embodiment of the present invention, it is nevertheless to be understood that minor changes may be made therein without departing from the spirit and scope of the invention as claimed.

What I claim as new is:

1. A drafting device comprising a board, a roller adjacent one end of said board, said board and said roller being adapted to receive an endless sheet of paper in an encompassing relation, a wheel journalled at each end of said roller, and a pair of leaf springs anchored by one of their ends to said board, each of said springs by its opposite end engaging one of said wheels, normally said springs urging said roller away from said board for maintaining the endless sheet of paper in a stretched condition.

2. A drafting device comprising a board, a roller co-acting with one end of said board, said board and said roller being adapted to receive an endless sheet of paper in an encompassing relation, means for normally urging said roller away from said board for maintaining the endless sheet of paper in a stretched condition, normally the endless sheet of paper exerting a force

upon said roller in the direction of said board, and means in substantially anti-frictional contact with the roller between the edges of said endless sheet resiliently urged thereagainst for counteracting said force while permitting rotation of said roller.

3. A drafting device comprising a board, a roller co-acting with one end of said board, said board and said roller being adapted to receive an endless sheet of paper in an encompassing relation, means for normally urging said roller away from said board for maintaining the endless sheet of paper in a stretched condition, normally the endless sheet of paper exerting pressure upon said roller in the direction of said board, and means for counter-acting said pressure, said last named means including tensioning wheel mounted in said board, said tensioning wheel being positioned intermediately the end of said roller, said tensioning wheel contacting the periphery of said roller in a transverse direction for urging said roller away from said board.

4. A drafting device comprising a board, a roller co-acting with one end of said board, said board and said roller being adapted to receive an endless sheet of paper in an encompassing

relation, tensioning means carried by said board and connected with said roller for normally urging the latter away from said board for maintaining the endless sheet of paper in a stretched condition, and means for rendering said tensioning means inoperative during application of the endless sheet of paper around said board and said roller, said last named means including a pair of arms hingedly connected to said board, said arms being adapted to engage said roller for maintaining the same in a rigid position with relation to said board.

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