

May 31, 1927.

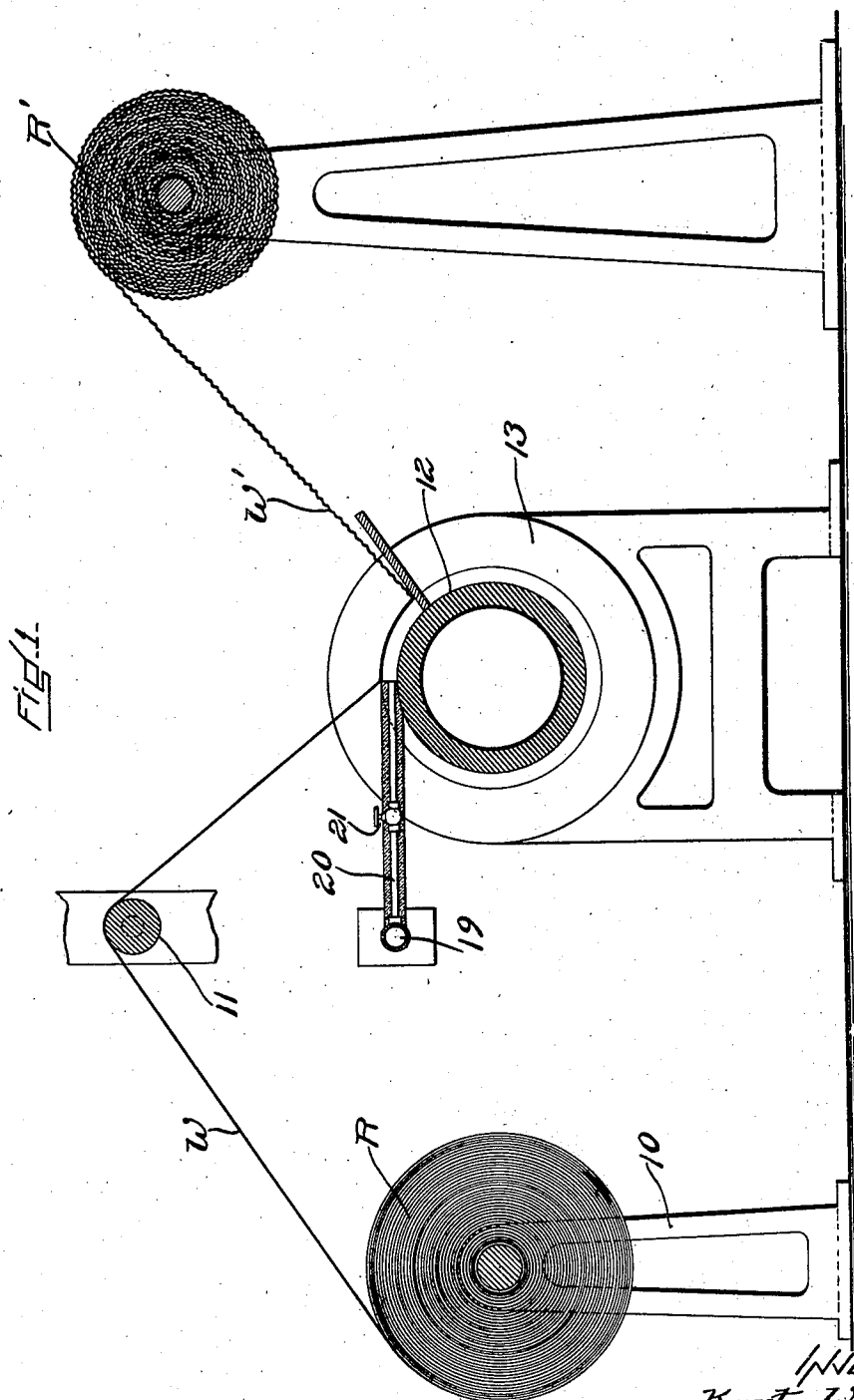
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K. WANDEL

PAPER CREPING APPARATUS

Filed March 18, 1920

3 Sheets-Sheet 1



INVENTOR=
Kurt Wandel
By Clyde L. Rogers
his ATTORNEY=

May 31, 1927.

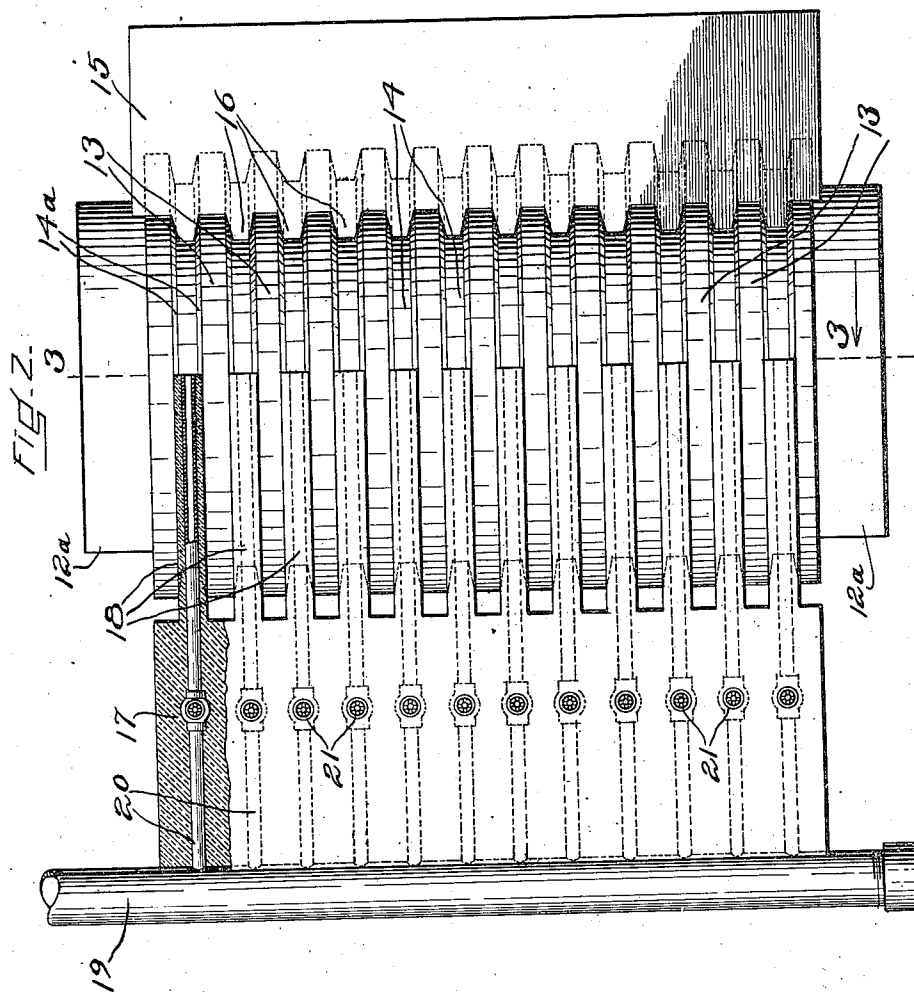
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PAPER CRÉPING APPARATUS

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3 Sheets-Sheet 2



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FIG. 3.

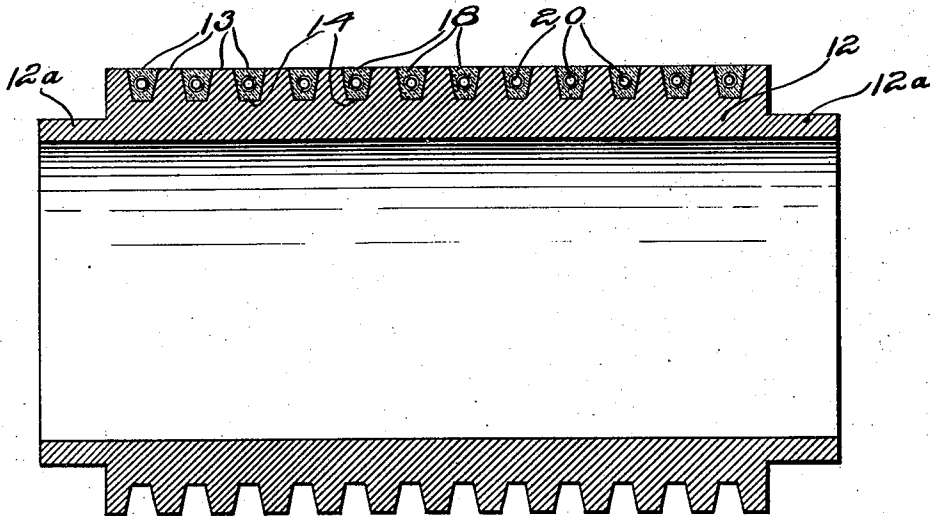
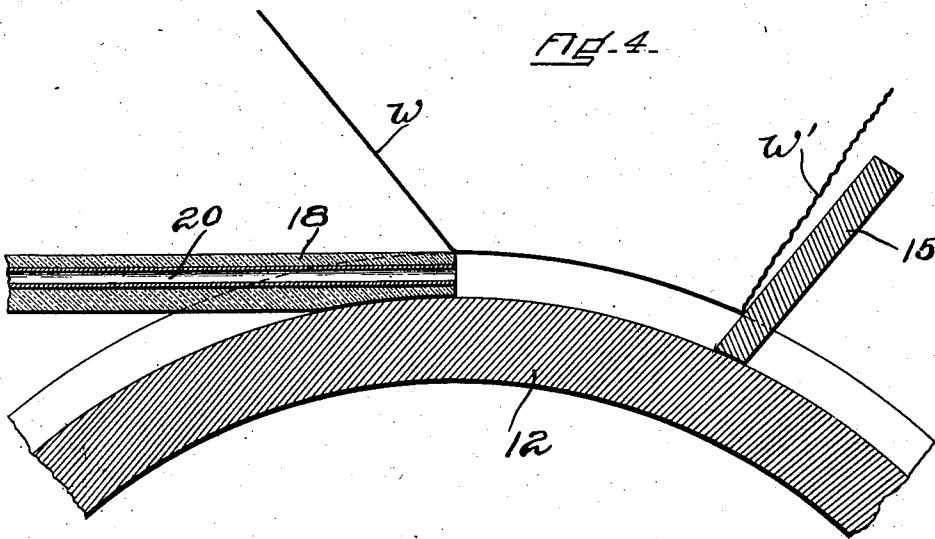


FIG. 4.



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Patented May 31, 1927.

1,630,320

UNITED STATES PATENT OFFICE.

KURT WANDEL, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO ARKELL SAFETY BAG COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PAPER-CREPING APPARATUS.

Application filed March 18, 1920. Serial No. 366,823.

This invention relates to the creping or crinkling of paper to render the same stretchable and for other purposes and more particularly to apparatus for this purpose wherein the paper web is caused to adhere to the crinkling drum by air pressure which permits the paper to be crinkled dry or without preliminary soaking in water as has been necessary in methods of crinkling heretofore in common use. One principal object of the invention is to provide means whereby an air pressure effective for causing the requisite adherence of the paper to the roll may be produced by an air suction device which is located at the periphery of the crinkling drum thus dispensing with the need of any interior suction box or perforations through the drum. In accordance with my invention this feature is co-operatively arranged, and carried out in conjunction with an improved construction and type of crinkling drum wherein continuous paper supporting areas are provided circumferentially of the drum with an elimination of ledges or corners against which the paper might otherwise be caught and pinched by the crinkling doctor which co-operates with the drum. In this improved type of crinkling drum the continuous paper supporting areas of the drum alternate throughout the operative length of the drum with suction areas which are obtained by peripheral grooves extending circumferentially of the drum and with which the peripheral suction device of my invention co-operates. The invention further provides a limited and strictly circumscribed suction area on the surface of the drum directly forward of the doctor with provision for effective packing of this suction area so that there is no loss of or only a minimum loss of the suction effect by leakage. The foregoing and other objects and advantages of the invention will more fully appear from the following detailed description, and the distinctive features of novelty will be thereafter pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a diagrammatic lengthwise vertical section of an apparatus embodying the invention;

Fig. 2 is a partial plan view on an enlarged scale showing the immediate working parts;

Fig. 3 is a vertical section on line 3—3 of Fig. 2; and

Fig. 4 is an enlarged transverse sectional detail showing the co-operative relation of the immediate working elements of the device.

10 indicates a mounting for a roll of paper R from which the web W to be treated is drawn. This web is shown as led around a suitably mounted guide roll 11 and thence is drawn on to a crinkling drum 12. This drum has projecting trunnions 12^a at its ends mounted for rotation in a suitable housing support 13 and is driven in any suitable manner (not shown). This drum is shown as a hollow shell but this form is merely adopted for saving of material and lightness, since so far as the present invention is concerned the drum might be a solid cylinder. This drum is formed throughout the operative length thereof with a series of continuous paper supporting areas 13 which alternate with circumferential grooves 14, the walls of these grooves being preferably somewhat tapered outwardly as indicated at 14^a. A doctor blade 15 is stationarily mounted for co-operation with this crinkling drum and its operative edge is equipped with a series of fingers or projections 16 extending into the grooves 14 and shown as beveled so as to fit closely therewith, the ends of said projections extending to the bottom of the grooves so that this edge of the doctor makes a close fit throughout with the surface of the drum. Thus, the fingers themselves serve to prevent leakage of air underneath the doctor, although the use of such fingers for this purpose is not essential and the purpose may be accomplished by other means. A packing block 17 is stationarily mounted forward of the doctor and equipped with projections or fingers 18 extending tangentially of the drum and with their forward ends formed to fit closely the grooves 14 while the tops of said projections lie flush with the paper supporting surfaces 13 of the drum. The ends of these projections 18 are spaced a small angular distance from the doctor sufficient so that the extent of the grooves 14 from such ends to the doctor is sufficient to provide suction areas adequate for holding the paper adherent to the drum to draw it forward and present it to the doctor. 19 indicates a pipe leading

from a suitable source of air suction such as an ordinary suction pump (not shown). From this pipe a series of branches 20 lead through the respective projections 18 to the ends thereof and so as to communicate with the suction areas provided by the grooves 14 between the ends of the projections and the doctor. These branches may be controlled by a series of individual valves 21 so that the required air suction effect may be provided and varied selectively as required for best results. The paper web W is caused to adhere strongly and uniformly to the crinkling drum by the suction thus produced in the suction areas of the grooves 14 and is thus drawn from the supply roll and presented to the doctor 15 from which it is cleared with a scuffing or pressing back upon itself which produces a crinkled web W' that may be led on to a take-on roll R' or otherwise taken care of. The action of the doctor in producing this crinkled effect is generally similar to that by which crinkled paper has been heretofore produced, but it is to be noted that by reason of the strong adherence of the paper to the drum produced by the suction effect, the paper does not require to be soaked, or even necessarily moistened at all, it being possible to crinkle even heavy grades of paper in a commercially dry state if desired. This adherence of the web to the crinkling drum may also be utilized to draw the paper from the supply roll by the action of the crinkling drum and without requiring any other feeding instrumentality and no press roll co-operative with the crinkling drum is required as is the case in crinkling paper that has been previously wetted as has been the common practice heretofore. It is to be particularly noted that since the surface portions 13 of the crinkling drum present continuous paper supporting areas circumferentially of the drum, and since the fingers 16 of the doctor fit into the intermediate grooves between such areas, there are no projections or ledges on the surface of the crinkling drum that could catch or cause pinching of the paper against the doctor which would tend to tear or produce holes therein. The present means for producing the suction effect is particularly simple and efficient in that it dispenses with the need of any suction box interior of the drum or of perforating the drum as has hitherto been proposed to obtain the required suction. With the described construction all the working parts are not only of the greatest simplicity but they are located so as to be conveniently accessible for attention and control and the crinkling drum itself is an element inexpensive and easy to produce without requiring any considerable machining other than merely turning the grooves therein as described. I am aware that the

invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Paper crinkling apparatus, comprising a crinkling drum, a doctor co-operative therewith, and means external of the drum for holding the paper adherent thereto by air suction in advance of the doctor, said drum presenting a series of continuous supporting areas circumferentially of the drum alternating with circumferential grooves constituting suction areas, said supporting areas acting to hold the paper substantially out of said grooves.

2. Paper crinkling apparatus, comprising a crinkling drum, a doctor co-operative therewith, and means external of the drum for holding the paper adherent thereto by air suction in advance of the doctor, said drum presenting a series of continuous supporting areas circumferentially of the drum alternating with circumferential grooves, said supporting areas acting to hold the paper substantially out of said grooves, said doctor having a series of projections entering said grooves of the drum.

3. Paper crinkling apparatus, comprising a crinkling drum having an operative surface composed of a series of circumferential paper supporting areas alternating with a series of circumferential grooves, a doctor having projections entering such grooves, a packing device comprising a series of fingers fitting said grooves a substantial distance forward of the doctor, and an air suction conduit having branches extending through said projections.

4. Paper crinkling apparatus, comprising a crinkling drum presenting a series of circumferential paper supporting areas alternating with a series of circumferential grooves, said grooves having beveled side walls, a doctor having projections tapered to enter said grooves, a packing device having a series of projections also tapered to fit said grooves, said projections terminating a substantial distance forward of the doctor, and an air suction conduit having branches extending through said packing projections.

5. Paper crinkling apparatus, comprising a crinkling drum having an operative surface composed of a series of circumferential supporting areas alternating with a series of circumferential grooves, said supporting areas acting to hold the paper substantially out of said grooves, crinkling means asso-

ciated with said drum, and a suction device external of said drum and communicating with said grooves for holding the paper on said supporting areas as the paper meets the crinkling means.

6. Paper crinkling apparatus, comprising a crinkling drum having an operative surface composed of a series of circumferential supporting areas alternating with a series of circumferential grooves, said supporting areas acting to hold the paper substantially

out of said grooves, crinkling means associated with said drum, portions of such grooves in the region of the crinkling means being segregated from the remaining portions thereof, and a suction device external of the drum communicating with said segregated portions of the grooves.

In testimony whereof, I have signed my name to this specification.

KURT WANDEL.