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Gerstein

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[54] **PACKAGE CONSTRUCTION AND METHOD FOR FORMING A STRIP OF INDIVIDUAL IMPREGNATED TISSUES INTO CONTAINERS**

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[52] **U.S. Cl.** ..... **53/21 FC,** 53/21 FW, 53/117

[51] **Int. Cl.** **B65b 63/04**

[58] **Field of Search** ..... 53/21 FC, 21 FW, 21 R, 53/36, 116, 117

[56] **References Cited**

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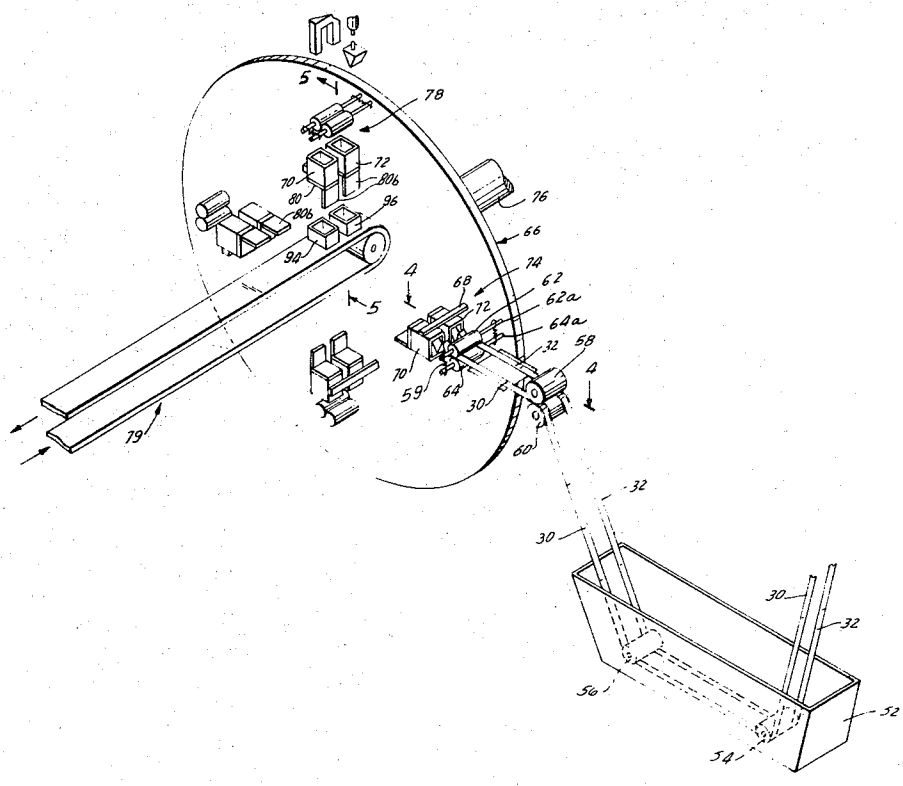
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Primary Examiner—Travis S. McGehee

[57] **ABSTRACT**

A device for forming a package of impregnated tissues from a continuous roll of a lightweight fiber material such as a tissue comprises means for feeding the tissue for slitting longitudinally into one or more lengths of tissue and then for perforating the lengths at definite fixed intervals across the width thereof. The perforated lengths are separated and fed separately through folding gauges where they are parted with one or more folds and one or more of these lengths are fed simultaneously into a bath for impregnating the tissue with a liquid substance such as a face cleaning solvent of a type which is incorporated in the known wash tissues. The impregnated tissues are then fed continuously and directly into guide tubes and thereafter transferred directly into packing containers into which they are stuffed. The stuffing mechanism comprises an arrangement for feeding the respective continuous lengths of the impregnated tissue into a stuffing container to accumulate a compacted pile and thereafter transferring the pile into a packing container. The pile is formed and compacted merely by feeding the tissue at high speed into the stuffing container in which the tissues become packed.

18 Claims, 6 Drawing Figures

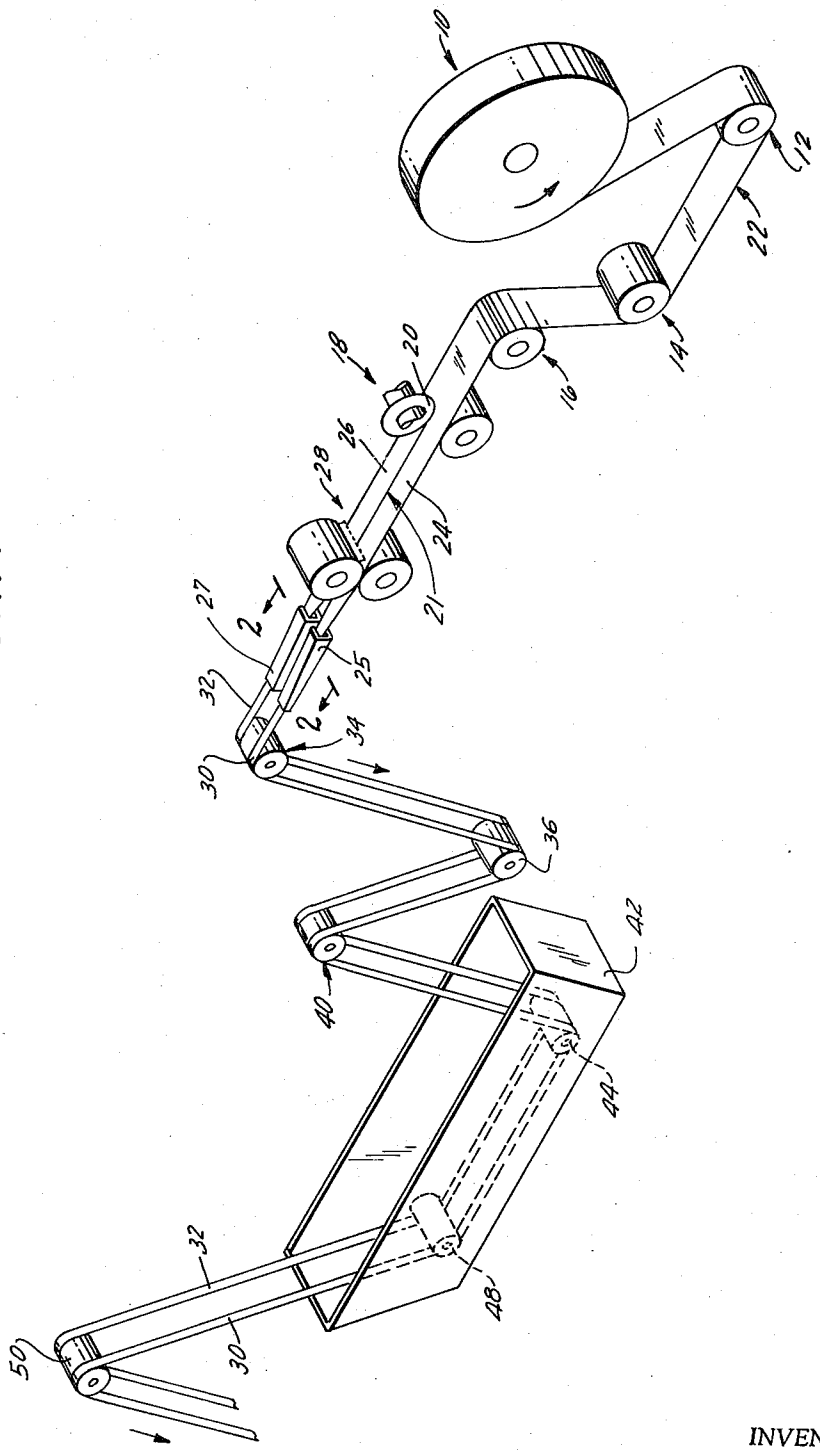


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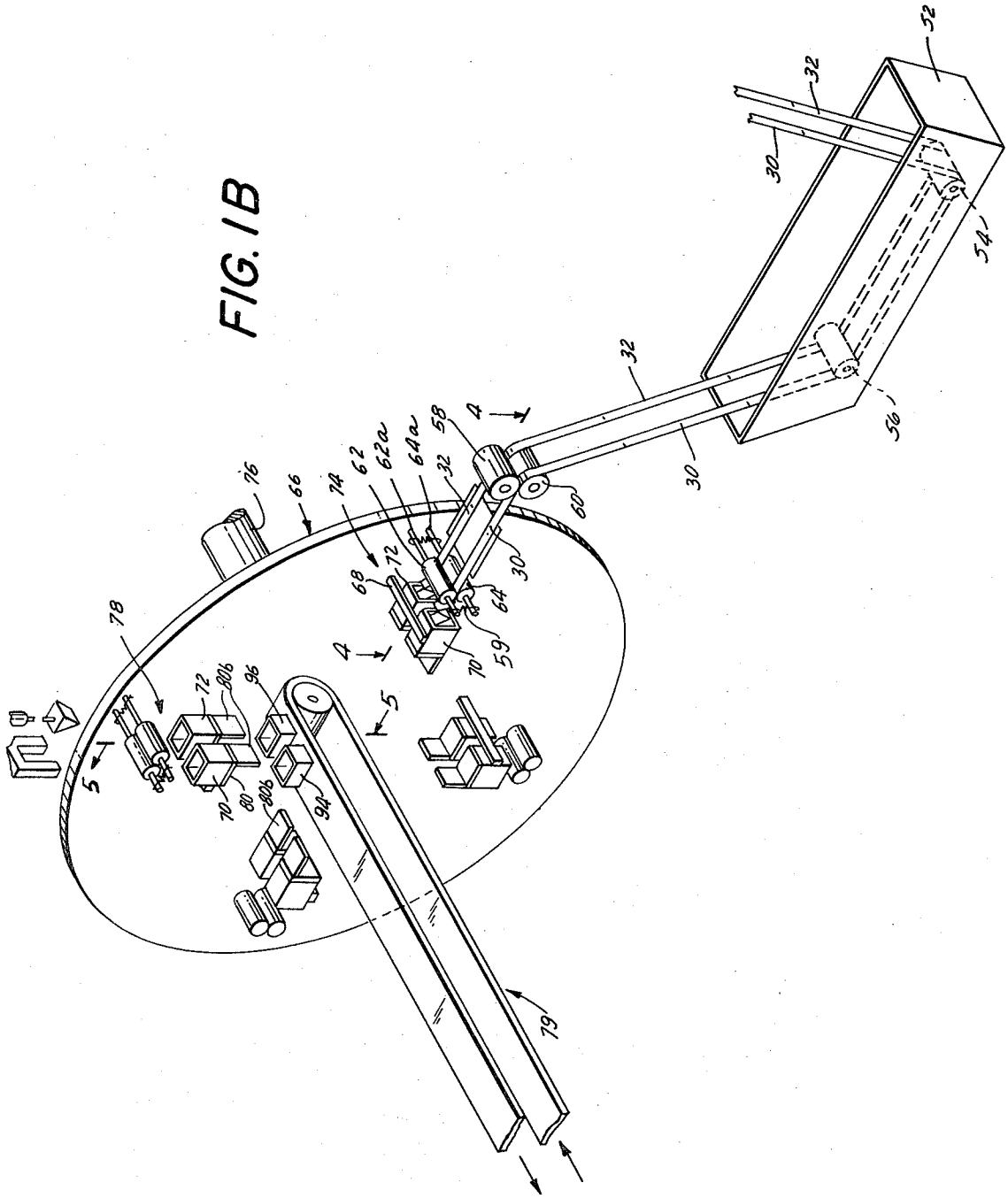
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FIG. 1A



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FIG. 1B



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FIG. 2

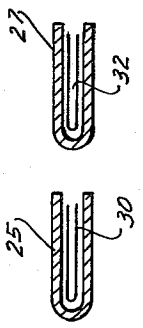


FIG. 3

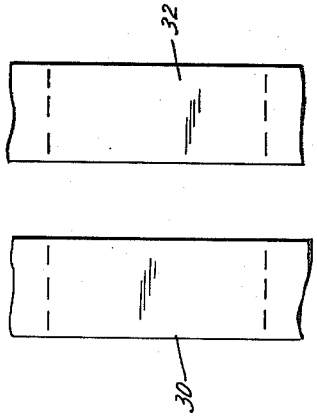
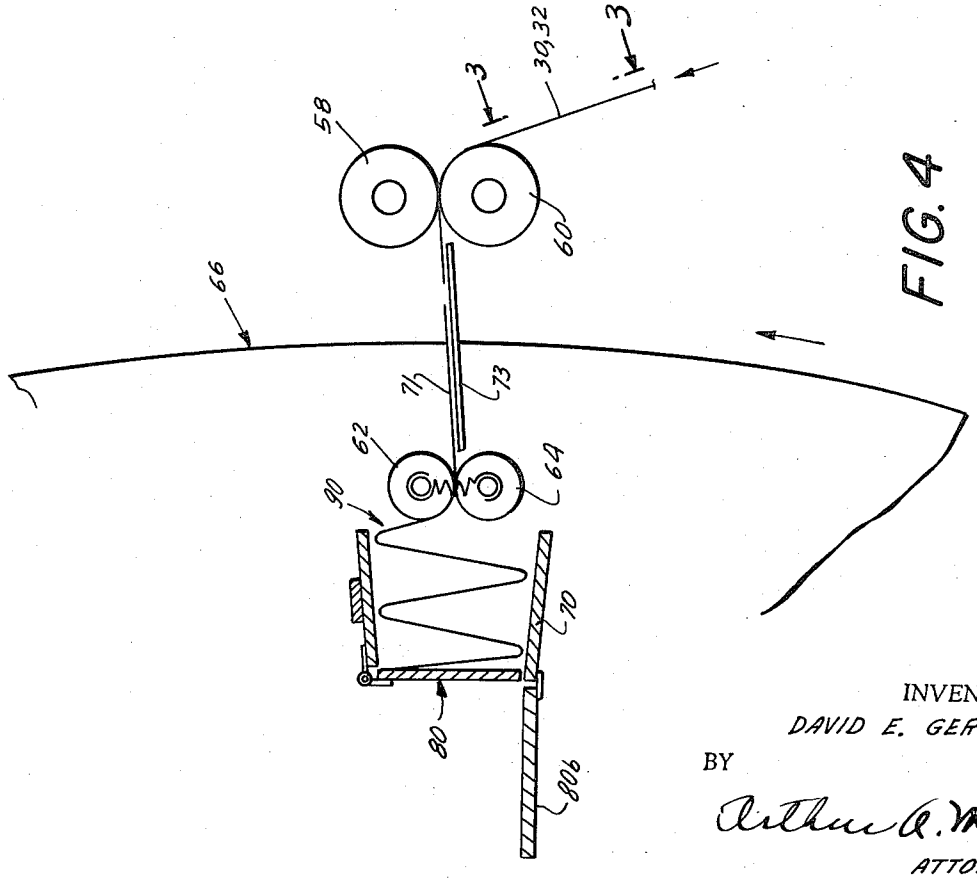


FIG. 4



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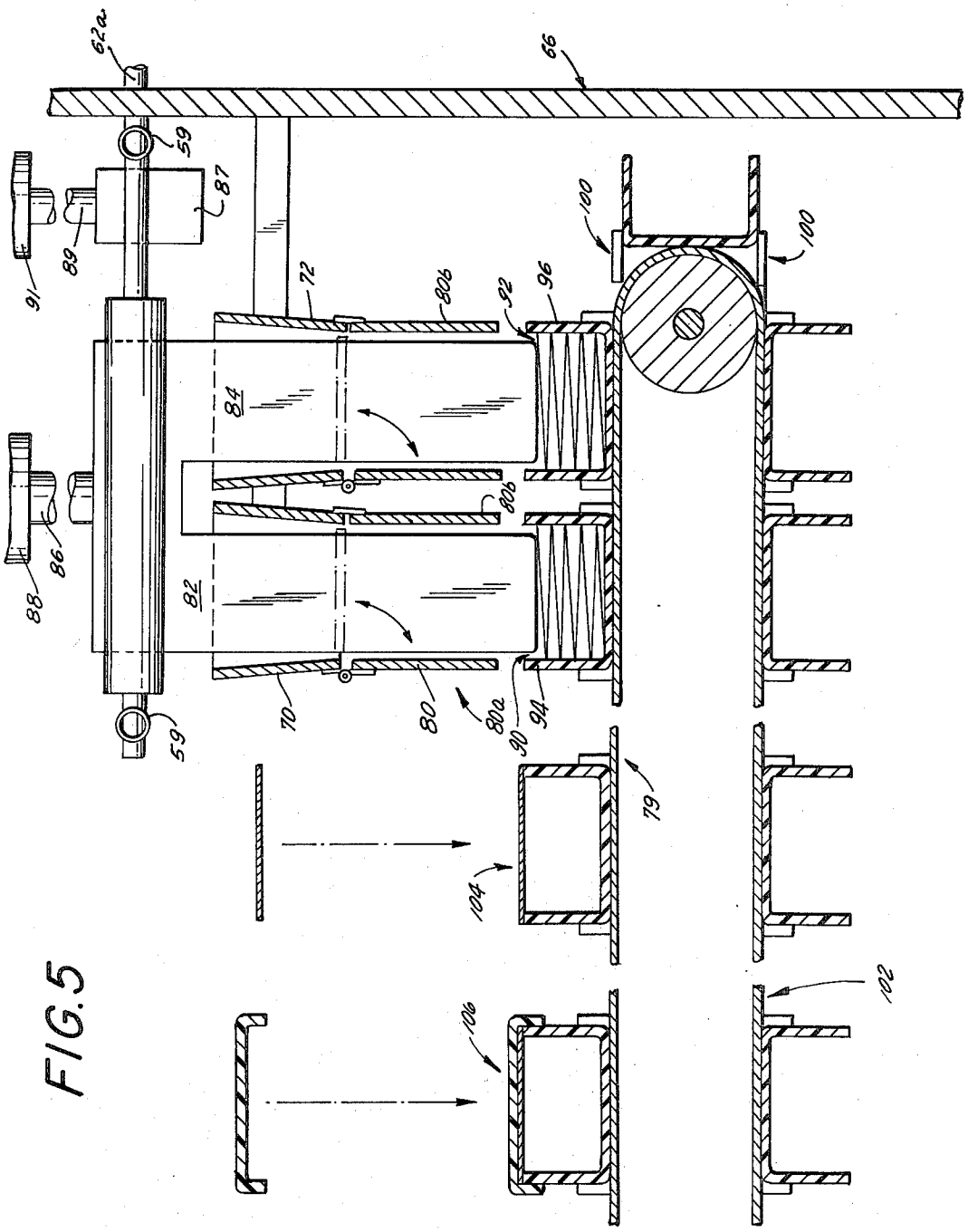


FIG. 5

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PACKAGE CONSTRUCTION AND METHOD FOR FORMING A STRIP OF INDIVIDUAL IMPREGNATED TISSUES INTO CONTAINERS

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates in general to the construction of devices for forming useful paper products and, in particular, to a new and useful device and method for forming a package of a continuous strip of individual tissue elements which are separated by score lines and impregnated with a treatment liquid and to a package of such material.

DESCRIPTION OF THE PRIOR ART

At the present time it is known to form fibrous material or tissue paper into individual lengths which are impregnated with a liquid material so that the length of tissue may be packed in a tightly sealed container for subsequent opening so that the tissue may be used as a wash cloth. A disadvantage of such a construction is the high cost of manufacture of the individual impregnated tissues and the difficulty of removing them from the individually wrapped packages when they are to be used. It is highly desirable that tissues of this nature be arranged in a tightly sealed container in a manner such that they can be removed one after the other without having to first tear open individual packages in which they are wrapped. One of the reasons why this has not been possible heretofore is that there is no way of both impregnating the tissue and for feeding it into a package such that they may be dispensed, for example, one after the other when they are to be used.

SUMMARY OF THE INVENTION

In accordance with the present invention, there is provided a method and device for forming continuous lengths of separable tissue elements which are impregnated with a liquid material (e.g. a soap, an antiseptic, a dentifrice, etc.) and which are packaged in a container such that they can be drawn out one after the other for use. With the inventive arrangement, the individual tissue elements are formed by feeding a continuous web of a fibrous material such as lightweight tissue paper first into association with slitter means for dividing the length into several longitudinally extending widths each of which are perforated at regular spaced intervals in order to demarcate the individual tissues along the length of the widths which are fed. Each individual width is advantageously fed either directly into a bath in which they are impregnated with a liquid for facilitating their use e.g., as a wash cloth hand cleaner, tooth cleaner, etc. They may be fed first to folding means for folding them continuously as they are advanced in a longitudinal direction when folding is desired. Each continuous length is advanced beyond the impregnation bath and fed through guide tubes into individual packages in which they are stuffed so that they become packed. Since the individual tissues are still interconnected by their perforations they may be withdrawn from the container one after the other and separated along the line of perforations.

Accordingly, it is an object of the invention to provide an improved method and apparatus for forming individual interconnected lengths of tissues which are packed in an individual container.

A further object of the invention is to provide an apparatus in the form of a rotary receptacle unit having a plurality of angularly spaced temporary receptacle elements into which a continuous length of interconnected tissues are fed and temporarily packed for subsequent transfer into individual containers which are fed along on a connecting conveyor.

A further object of the invention is to provide a device for packing continuous lengths of individual tissues which are separated by perforation lines into containers after they have been impregnated with a liquid and which is simple in design, rugged in construction, and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference should be had to the accompanying drawing and descriptive matter in which there is illustrated a preferred embodiment of the invention.

BRIEF DESCRIPTION OF THE DRAWING

In the Drawing:

FIG. 1A is a perspective view of the first portion of an apparatus for feeding a web of fibrous material into an impregnation bath for subsequent delivery to means for stuffing the continuous length thus formed into individual packages;

FIG. 1B is a view similar to FIG. 1A of the remaining portion of the apparatus shown in FIG. 1A;

FIG. 2 is a section taken along the line 2—2 of FIG. 1A;

FIG. 3 is a partial top plan view of the individual webs which are fed to the folding gauges;

FIG. 4 is a partial elevational and partial sectional view of a rotary receptacle unit for receiving the impregnated tissues prior to packing them into containers; and

FIG. 5 is a partial sectional view of a packing station in which the individual containers are filled with the impregnated tissue.

GENERAL DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawing in particular, the invention embodied therein comprises, an apparatus for forming packages containing a continuous strip of interconnected tissues which are separated by perforation lines and which includes means for feeding a continuous web of fibrous material or tissue from a continuous reel **10** around a dancer roller **12** and a dancer roller **14** and over a guide roller **16** into association with slitter means **18.** The slitter means **18** includes an upper series of one or more slitter rolls **20** which engage the web **22** and forms it into two or more separate longitudinally extending webs by slitting along longitudinal slit lines **21,** and forms, in this instance, two longitudinal webs **24** and **26.** The webs **24** and **26** are fed into association with perforation means, generally designated **28,** which forms a line of perforations across the webs **24** and **26** at definite spaced intervals in order to form individual interconnected tissues which may be severed at the time of use from the remaining continuous webs **24** and **26.**

After the webs **24** and **26** are perforated and formed into individual interconnected tissues which are sepa-

rated by transversely extending lines of perforations, they are fed through folding gauges **25** and **27** to fold them into smaller widths of continuously interconnected tissues **30** and **32.** The interconnected tissues **30** and **32** are fed over a guide roller **34,** a dancer roller **36,** a dancer roller **40** and into a festoon or liquid applicator trough **42** in which they are treated to form them into hand tissues for use for such diverse things as face towels, shoe polishers, denture cleaners, etc., in accordance with the liquid treatment given.

The continuous tissue lengths **30** and **32** pass under submerged guide rollers **44** and **48** arranged at respective ends of the trough **42** and move upwardly over a dancing roller **50** after they have been impregnated with a liquid, for example, of a type which permits the device to be used as a washing tissue or cloth.

In some instances, a second treatment of the tissue is desirable, in which case, the tissue is again fed into a trough **52** containing a treatment liquid and guided under rollers **54** and **56** which are submerged at respective opposite ends of the trough **52** and then move outwardly between press rollers **58** and **60** for further feeding between stuffing rollers or nip rollers **62** and **64.** The nip rollers **62** and **64** are urged together by springs **59** which are engaged around the respective nip roller shafts **62a** and **64a** at a plurality of locations along the lengths of these shafts.

In accordance with the feature of the invention, the stuffing rollers **62** and **64** are arranged in sets directly at a plurality of stuffing stations on a rotary receptacle unit, generally designated **66,** which includes a plurality of holders **68** for stuffing containers **70** and **72** for the respective tissues **30** and **32.** The nip rollers **62** and **64** discharge the tissues at a speed and direction such that they continuously fill into the stuffing containers **70** and **72** which also provide guides and gauges for estimating a full package quantity of the tissues to be packed. This is accomplished at a station, generally designated **74,** which is located directly at the discharge of the press rollers **58** and **60.** After a given charge of tissue is loaded in the containers **70** and **72,** the tissues are cut away from the remaining webs **30** and **32** by the stopping of the press rollers **58** and **60** and the continued feeding of the nip rollers **62** and **64.** The cut away webs **30** and **32** are guided down an inclined surface **71** of a guide plate **73** located between the press rollers **58** and **60** and the nip rollers **62** and **64** for the next feed cycle. The rotation is carried out until the filled containers **70** and **72** become oriented at a station, generally designated **78,** in which the containers with their closed bottoms **80** are oriented over a conveyor, generally designated **79.**

The stuffing containers **70** and **72** shown in FIG. **5** include bottoms **80** formed of bottom flaps **80a** and **80b** which are folded upwardly to form a temporary closure of the containers **70** and **72** during the time at which they are stuffed. These bottom flaps **80***a* and **80***b* are forced open by squared stuffing members **82** and **84** which are carried on a rod **86** which is moved by actuating a fluid pressure cylinder **88.** The stuffing members **82** move between the nip rollers **62** and **64** after they are first separated by the movement of a wedge member **87** which is shifted by a piston rod **89** associated with a piston movable in a control cylinder **91.** Once the fluid pressure is supplied to the cylinder **88,** the rod **86** is moved downwardly with the stuffing members **82** and **84** to move them between the separated rollers **62** and **64** and into the stuffing containers **70** and **72** to force the packed lengths of tissue **90** and **92** downwardly into receiving containers **94** and **96** which are oriented in receiving guides **100** defined at fixed lengths along the conveyor belt **102** of the conveyor **79.** The filled containers **94** and **96** are then moved into association with means for applying a seal **104** and then for applying a closure cap **106.**

It should be appreciated that in the embodiment shown, the containers **94** and **96** are shown as being simple shallow depth plastic containers **94** having a flat seal **104** thereover. It should be appreciated, however, that the container may, for example, comprise a container of a type having a slotted opening at the top through which the uppermost tissue extends and which, for example, could have tearing means associated therewith to permit pulling out of one tissue and tearing off of this tissue at a location which would still leave enough of the next tissue projecting to permit it to be engaged for removal after the first has been used.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A method of forming packages with a continuous strip of separate liquid impregnated tissues which are separated from each other by perforations, comprising feeding a continuous web of lightweight material such as a tissue through a continuous feed path, perforating the web to form perforation lines extending thereacross at spaced locations along the length thereof and to form individual separable tissues between the perforations, directing the tissues interconnected by perforation lines into a treatment bath, moving the treated tissues out of the treatment bath while they are still interconnected by the perforations, and feeding the web of connected treated tissues into a stuffing container whereby said web is folded as it is fed into said stuffing container and wherein said web of connected tissues are fed into a stuffing container to accumulate a quantity of said connected tissues equivalent to the amount adapted to be packed in a packing container, severing the web of accumulated tissues from the remaining length of said web of tissues, and forcing the accumulated tissues from the stuffing container and into a packing container disposed adjacent thereto.

2. A method according to claim **1,** wherein the continuous web of tissue is first slit longitudinally to form it into a plurality of individual lengths of interconnected tissue members.

3. A method according to claim **1,** wherein the continuous length of tissue is folded as it is fed longitudinally.

4. An apparatus for stuffing tissue into containers comprising a stuffing container having a bottom with a closable flap, movable between a closed and opened position, tissue feed means for directing a continuous length of interconnected tissues separated by perforations into said stuffing container, and stuffing means located adjacent said stuffing container and being movable through said stuffing container to force the accumulated tissues in said stuffing container to open said bottom flap, whereby said accumulated tissues are adapted to be transferred to a packing container, said stuffing means being movable to direct the material of

said stuffing container through the opening when said bottom flap is open and into said packing container.

5. An apparatus according to claim **4,** wherein said tissue feed means includes a pair of rotatable press rollers at a spaced location from said stuffing container and a pair of rotatable stuffing rollers adjacent said press rollers, the tissue being fed between said press rollers and said stuffing rollers, said press rollers being stopable to cause the severance of the tissue from the remaining length by the continued rotation of said stuffing rollers.

6. An apparatus according to claim **5,** including means biasing said stuffing rollers together, means for temporarily separating said stuffing rollers, and wherein said stuffing means comprises a member movable between said stuffing rollers when they are separated to enter into said stuffing container.

7. An apparatus according to claim **4,** including a conveyor, a plurality of packing containers carried on said conveyor movable through a path underlying said stuffing container for positioning a packing container below said stuffing container.

8. An apparatus according to claim **4,** including a plurality of stuffing containers arranged in a row, said tissue feed means directing a plurality of separate lengths of continuous tissues interconnected by perforation lines into association with corresponding one of said stuffing containers, said stuffing means overlying all of said stuffing containers and being movable through a path to move through said stuffing containers to open the bottom flaps thereof and to force the material stuffed into said stuffing containers downwardly to transfer said accumulated tissues in said stuffing container into packing containers.

9. An apparatus according to claim **4,** including web feed means for continuously feeding a length of web material, means for slitting the length into a plurality of lengths of web material, and means for perforating the plurality of lengths to form individual interconnected tissues, said interconnected tissues being fed by said tissue feed means into said stuffing container.

10. An apparatus according to claim **4,** including means for immersing said length of tissues into a treatment bath before it is directed into said stuffing container.

11. An apparatus for impregnating and packing a length of web of connected individual tissues, comprising means for feeding a continuous web of fibrous material through a feed path, means for perforating said fibrous material across the width thereof to form the fibrous material into individual tissues interconnected by perforation lines, liquid treating means disposed along said feed path adapted to contain a bath of treating liquid, means for guiding said web of connected tissues through said treating liquid, at least one stuffing box, said stuffing box having a bottom which is closable for filling the stuffing box and which is openable to permit the filled material to pass therethrough into a packing box, means for continuously feeding the interconnected tissues into said stuffing box, and means to push the material which is stuffed into said stuffing box through the bottom and into a packing box.

12. An apparatus according to claim **11,** including means for sealing said packing box.

13. An apparatus according to claim **11,** including slitter means located along said feed path for slitting said web into a plurality of individual lengths of interconnected tissues separated by perforation lines.

14. An apparatus according to claim **13,** including folding means located in said feed path for folding the tissues as it is fed.

15. An apparatus according to claim **11,** wherein said liquid treating means includes a plurality of liquid treatment troughs comprising said liquid treatment means and means for guiding said interconnected tissues successively through said treatment troughs.

16. An apparatus according to claim **11,** including a rotary receptacle unit, said unit having a plurality of angularly spaced stations, each station including at least one stuffing box, said rotary unit being oriented to present each station successively into association with said feed path to position said stuffing boxes in a position to receive the tissue which is fed.

17. An apparatus according to claim **15,** including stuffing roller means for feeding said continuous length of interconnected tissues into said stuffing boxes carried by said rotary receptacle unit.

18. An apparatus according to claim **17,** including a conveyor extending adjacent to said rotary unit and being centrally positioned in respect to said unit, said stuffing containers being located around the periphery of said unit and being selectively alignable over said conveyor, said conveyor having means for carrying packing containers thereon for successively positioning said packing containers directly below said stuffing container.

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