United States Patent [19]

Wymann

[11] **3,861,062**

[45] **Jan. 21, 1975**

[54] **ARRANGEMENT FOR DRYING A FABRIC**

[75] Inventor: **Hans Wymann**, Tann-Ruti/ZH, Switzerland

[73] Assignee: **Ruti Machinery Works Ltd., formerly Caspar Honeggen**, Ruti/ZH, Switzerland

[22] Filed: **June 15, 1972**

[21] Appl. No.: **263,232**

[30] **Foreign Application Priority Data**

June 18, 1971 Switzerland 8917/71

[52] **U.S. Cl.** **34/160**, 34/155

[51] **Int. Cl.** **F26b 13/04**

[58] **Field of Search** 34/160, 159, 155, 153, 34/152, 156, 23, 151, 158, 24, 94; 139/291; 118/63

[56] **References Cited**

UNITED STATES PATENTS

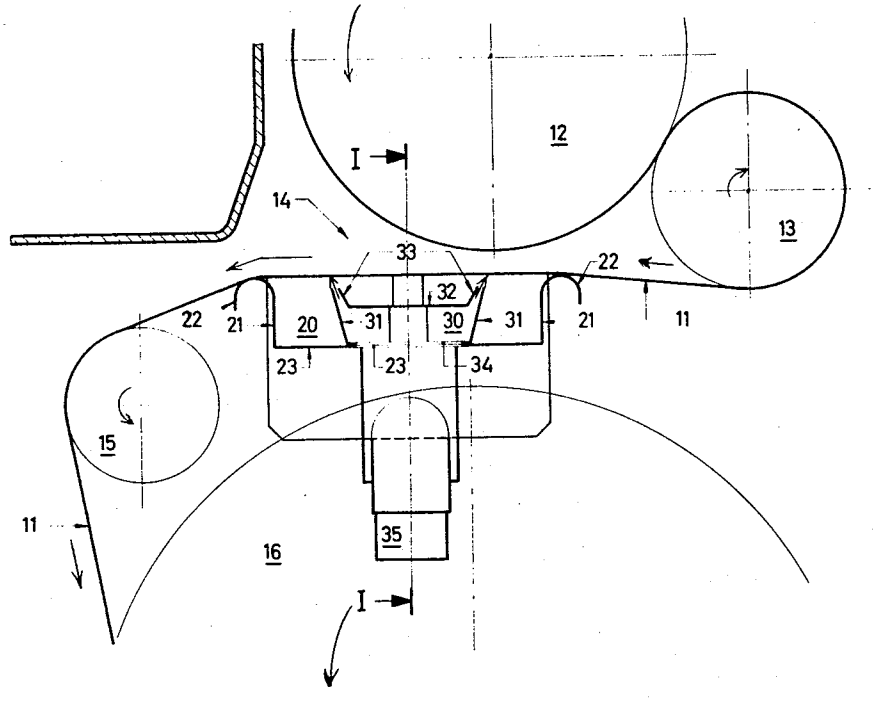
1,507,002	9/1924	Roeder	34/160
2,696,192	12/1954	Birchler et al.	139/291
3,021,609	2/1962	Parkes et al.	34/158
3,199,222	8/1965	Hultgreen	34/155
3,230,637	1/1966	Taylor	34/155
3,279,091	10/1966	Freuler	34/156
3,447,247	6/1969	Paane	34/155
3,448,907	6/1969	Otepka et al.	34/156
3,585,729	6/1971	Fleissner	34/158
3,622,058	11/1971	Vits	34/156
3,629,953	12/1971	Fleming	34/158
3,650,043	3/1972	Overly et al.	34/160

Primary Examiner—Charles J. Myhre
Assistant Examiner—Paul Devinsky
Attorney, Agent, or Firm—Donald D. Denton

[57] **ABSTRACT**

An arrangement for air drying a textile material on a textile machine during weaving, wherein the material manufactured on the machine is in the moist or wet condition before winding onto the cloth beam.

4 Claims, 6 Drawing Figures



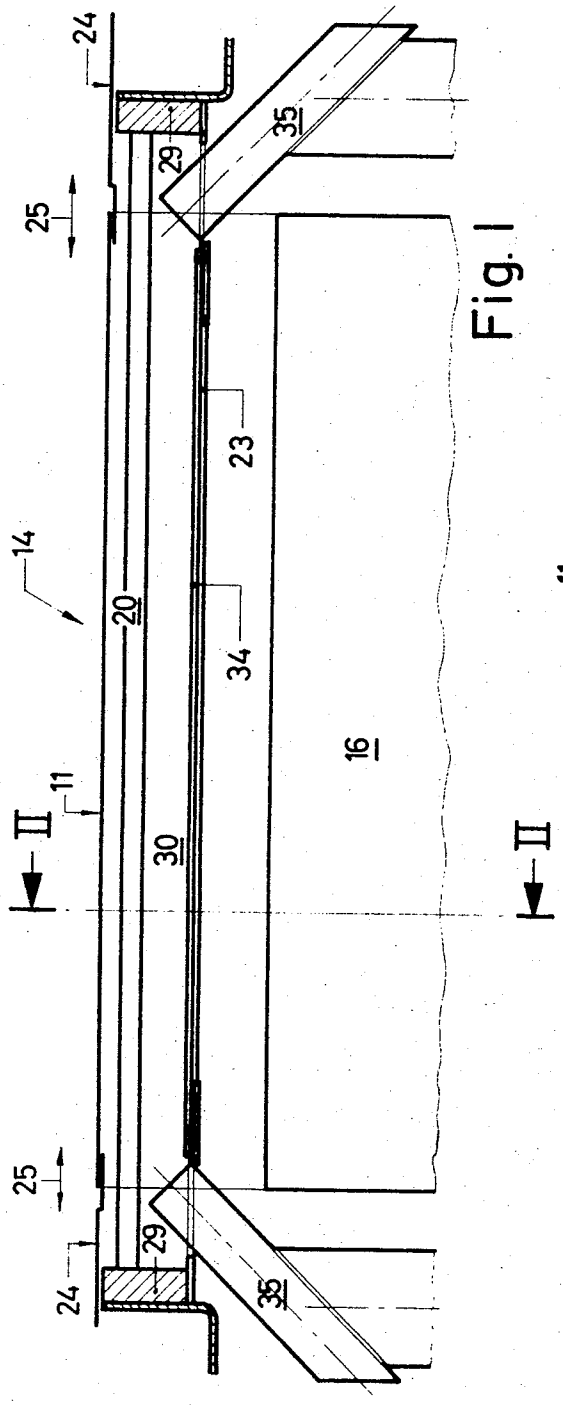


Fig. 1

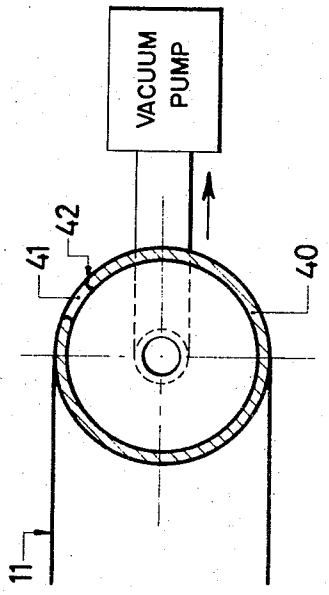


Fig. 4

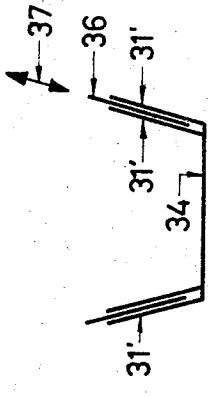


Fig. 3

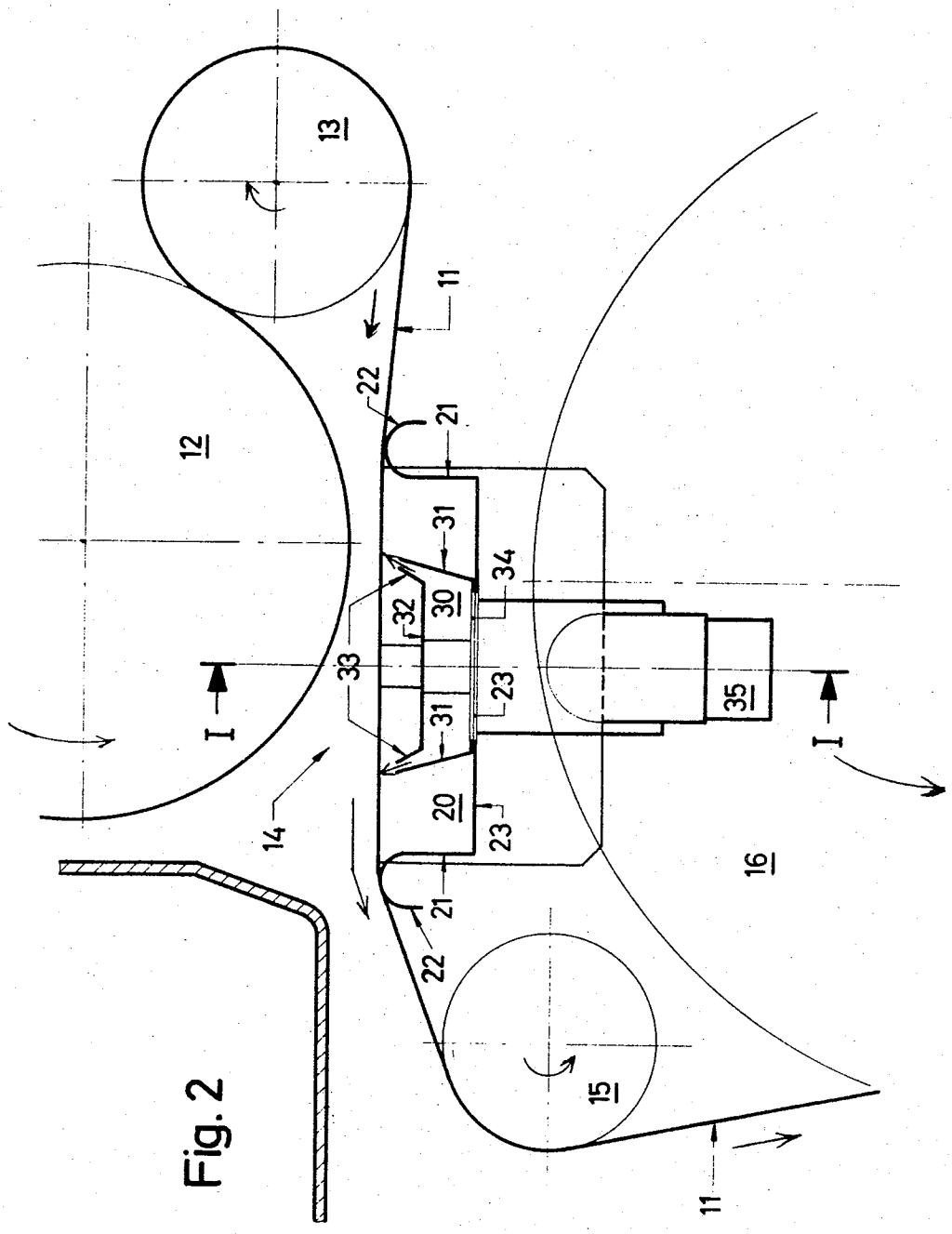


Fig. 2

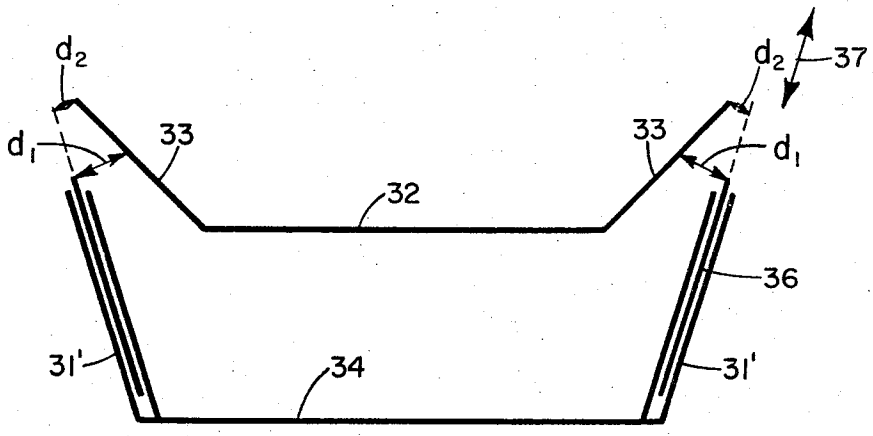


FIG. 5

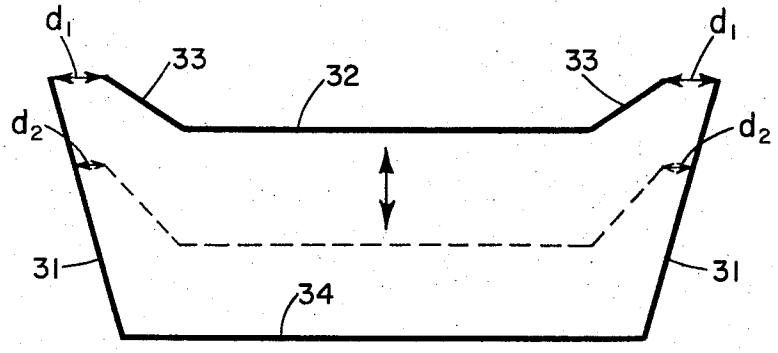


FIG. 6

ARRANGEMENT FOR DRYING A FABRIC

BACKGROUND OF THE INVENTION

In weaving processes wherein the weft threads are inserted or picked into the shed by means of a jet of liquid, the cloth or fabric formed is in a wetted condition. It is desirable and necessary to dry this cloth or fabric before it is wound onto the cloth beam. It is known to provide heat radiators for this purpose; however, the latter have various disadvantages. On the one hand, they require a large amount of energy so that they are expensive to operate. On the other hand, the rays (or at least rays of specific wave-length) destroy certain types of fabric. Finally, such radiators are sluggish in operation, that is to say on starting the machine, the development of heat is subject to delay and on shutting the machine down it "ceases" slowly; this impairs the uniformity of the fabric and, therewith, the quality thereof. Finally, these arrangements have the disadvantage that the drying effect or the degree of drying is not uniformly distributed over the width of the fabric.

For preparation of the ground weave for carpets, the said ground weave is, immediately after weaving, coated with a moist layer of glue. This glue coating must be dried before winding the fabric on a cloth beam. During this procedure, there prevail circumstances similar to those discussed hereinabove with reference to the loom operating with a jet of liquid; furthermore, there are the same disadvantages.

SUMMARY OF THE INVENTION

According to the present invention, these disadvantages are to be obviated. The invention is characterized in that there is provided an elongated, trough-like container with two longitudinal lateral walls that extend in the width direction of the textile material. The material is conveyed transversely of the longitudinal direction of the container and past it, the container being open towards the material so that an air chamber extending in the longitudinal direction of the container is formed and is adapted to receive drying air supplied to it through an air feed conduit means. The air chamber has at least one outlet slot extending in its longitudinal direction and into the interior of the container for passing the drying air against the wet woven material before it is wound onto the cloth beam.

The arrangement according to this invention can be advantageously employed where fabric material requires drying before wind-on. The known wet-weaving process is utilized particularly when an especially dense cloth is required.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in more detail by reference to embodiments thereof and to the drawings in which:

FIG. 1 is a section view in the longitudinal direction through an arrangement showing the container according to the invention, along the line I—I of FIG. 2;

FIG. 2 is a sectional view taken transversely of the container along the line II—II of FIG. 1;

FIG. 3 shows a cross-sectional view of another embodiment illustrating a sliding wall for controlling the flow of drying air onto the wet textile material;

FIG. 4 shows a cross-sectional view showing further development of the arrangement of FIGS. 1 and 2;

FIG. 5 is a cross-sectional view illustrating the sliding walls for controlling the flow of drying air and showing variations in width of the slots for emitting drying air therefrom; and

FIG. 6 shows an arrangement in which a cover plate is moved vertically to vary the width of the slots for emitting drying air therefrom.

DESCRIPTION OF PREFERRED EMBODIMENTS

In all the figures, like numerals are employed to designate like elements.

The embodiment shown in FIGS. 1 and 2 relates to an arrangement provided on a loom. What is concerned is a loom wherein the weft threads are inserted into the shed by means of a jet of water. The fabric or cloth **11** produced is, therefore, initially wet. It is wound from a taking-up or feed roller **12**, over a front deflecting roller **13**, over a drying arrangement **14**, and over a rear deflecting roller **15**, onto a cloth beam **16**.

The drying arrangement **14** comprises a container **20** having lateral walls **21**, the upper delimiting portions or free ends **22** of which may be bent over. The container **20** is of elongate, trough-like shape and is, as shown in FIG. **1**, somewhat longer than the width of the fabric **11**. The container **20** is open at the side facing the manufactured fabric or material **11**. On the opposite side, it is sealed by a base plate **23**, and at the ends by walls **29**.

Disposed within the container **20** is an air chamber **30** extending over the entire length of the container **20**. The air chamber **30** has two lateral walls **31** and a cover plate **32**. The lateral walls **31** extend in the direction away from the base plate **34** of the chamber **30**, obliquely outwardly. Attached to the longitudinal edges of the cover plate **32** are side plates **33** which also extend away from the longitudinal edges of the cover plate **32**, obliquely outwardly.

Provided at both ends of the air chamber **30** are feed conduits **35** through which drying air may be introduced into the chamber **30**. As drying air, preferably hot air is employed.

In operation, the fabric **11** is conveyed slowly over the container **20**. Meanwhile, the open upper side thereof is covered by the fabric **11**. The drying air introduced through the feed conduits **35** into the air chamber **30** flows between the walls **31** and the plates **33** and against the underside of fabric **11**, whereby the latter is dried as it travels from the right-hand to the left-hand lateral wall **21**, as seen in FIG. **2**. If the fabric, as shown in FIG. **1**, completely covers the upper, open portion of the container **30**, a noticeable portion of the air passes through the fabric, whereby the drying effect is reinforced.

It is advantageous if the slots formed by the upper or free edges of the lateral walls **31** and the side plates **33** (shown as d_1 and d_2 for various positions of cover plate **32** in FIGS. **5** and **6**) are in a spaced relationship such that the slots divide the width of the container **20** into three equal portions since, thereby, uniform distribution of the drying air is achieved, and this is important for uniform treatment of the material **11**. However, the arrangement **14** is distinguished by extremely uniform distribution of the drying air due to the fact that the latter is uniformly distributed in the air chamber **30** and therefore flows out uniformly over the entire length of the slots formed by the elements **31, 32.**

It is possible, by varying various elements, to influence the mode of operation or to achieve adaptation to varied conditions or circumstances. Due to upward and downward displacement of the cover plate **32** together with the side plates **33,** a variation is achieved in respect of the two slots formed by the free edges of the elements **31** and **33.** In particular the width of the said slots is varied.

However, the walls **31** and the plates **33** may also be designed for example in the manner shown in FIG. **3.** FIG. **3** represents for example a cross-section through the wall **31.** As will be seen, the latter is of double-wall construction. Between the individual halves **31'** of the wall **31** extends a sliding wall **36** adapted to be displaced in the direction of the double arrow **37,** whereby the width of the walls **31** may be varied. Thus the width designated as "d_1" and "d_2" in FIG. **5** is shown as variable.

FIG. **1** shows how the length of the upper free aperture of the container **20** may be varied. For this purpose, there are provided at both its ends slides **24** which may be displaced horizontally in the direction of the double arrow **25.** In this manner, the upwardly open portion of the container **20** may be adapted to various widths of the material **11** so that substantially all of the open portion of the container is covered by said material.

In yet a further example of an embodiment on a loom having insertion of the weft thread by means of a jet of water or, wherein the known wet weaving process takes place, there is provided at a location located before the container **20** a longitudinal edge at which a noteworthy portion of the water is "scraped off" when the wet material travels over the said longitudinal edge. An example of embodiment employing such a mode of operation is shown in FIG. **4.** According to that embodiment, there is employed a cylindrical breast beam **40** formed with a longitudinal slot **41.** FIG. **4** shows the said breast beam in cross-section.

In operation of the loom, the wet fabric or cloth **11** is conveyed under tension over the breast beam **40.** As this is done, a substantial portion of the water present in the wet material **11** is "scraped off" at the edge **42** of the slot **41** and flows into the interior of the hollow cylinder **40,** from where it is discharged. It is also possible to so select the length of the slot **41** that the latter is completely covered by the fabric **11.** If, in this case, additionally a low pressure is established within the cylinder **40,** then due to the air sucked in through the fabric **11** at the location of the lot **41,** a still further improvement of the drying process is achieved. The air suck-in may be accomplished by any suitable suction device or means **50** (such as a vacuum pump) operatively connected to said hollow cylindrical breast beam. The employment of a drying arrangement wherein the arrangement **14** is employed jointly with the arrangement shown in FIG. **4** has the advantage that the energy requirement (which per se is already relatively small) of the device shown in FIGS. **1** and **2** is still further reduced.

The disclosure of the preferred embodiments of the invention are illustrative thereof and various changes and modifications can be made as will be appreciated, all within the spirit and scope of the inventive concepts contained therein, and the invention is not to be restricted except by the scope of the appended claims.

What is claimed is:

1. Arrangement for drying a textile material on a weaving machine, wherein the material woven on the machine is in a wet condition before winding onto a cloth beam, characterized in that there is provided an elongated trough-like container having two longitudinal lateral walls that extend the width of the textile material to be dried and in contact with it, the spacing of said lateral walls of said container being at least equal to the width of the textile material to be dried and the material covering substantially all of the open portion of the container, said material being conveyable transversely of the longitudinal direction of the container and over it while being in intimate contact with said longitudinal lateral walls, and the container open towards said material; said container being arranged between two deflecting rollers between which the material is retained in a tensioned condition, the container having free ends attached to end portions of longitudinal lateral walls of said container that extend a short distance in the plane defined by the material between the deflecting rollers so that the material bears on said free ends as it passes over said container; an air chamber positioned longitudinally inside said container, said air chamber formed from a base surface, a cover plate and longitudinal lateral spaced walls, said longitudinal lateral spaced walls extending obliquely away from the base surface, and having side plates secured to said cover plate at their bottom longitudinal edges and extending obliquely upward therefrom, the free edges of the longitudinal lateral spaced walls and the free edges of the side plates secured to the longitudinal edges of the cover plate converge towards their longitudinal edges forming longitudinal air outlet slots, and the spacing of the cover plate and its side plates secured thereto adjustable in relation to said base surface so that the width of the opening of the air outlet slots in said air chamber may be varied; and air feed conduit means operatively connected to said air chamber for supplying drying air thereto.

2. Arrangement according to claim **1** in which said air chamber has two parallel outlet slots which are so spaced that the slots define, with reference to the width of the container, three equal portions.

3. Arrangement for drying a textile material on a weaving machine, wherein the material woven on the machine is in a wet condition before winding onto a cloth beam, characterized in that there is provided an elongated trough-like container having two longitudinal lateral walls that extend the width of the textile material to be dried and in contact with it, the spacing of said lateral walls of said container being at least equal to the width of the textile material to be dried and the material covering substantially all of the open portion of the container, said material being conveyable transversely of the longitudinal direction of the container and over it while being in intimate contact with said longitudinal lateral walls, and the container open towards said material; said container being arranged between two deflecting rollers between which the material is retained in a tensioned condition, the container having free ends attached to end portions of longitudinal lateral walls of said container that extend a short distance in the plane defined by the material between the deflecting rollers so that the material bears on said free ends as it passes over said container; an air chamber positioned longitudinally inside said container, said air chamber formed from a base surface, a cover plate

and longitudinal lateral spaced walls, said longitudinal lateral spaced walls extending obliquely away from the base surface, and having side plates secured to said cover plate at their bottom longitudinal edges and extending obliquely upward therefrom, the free edges of the longitudinal lateral spaced walls and the free edges of the side plates secured to the longitudinal edges of the cover plate forming longitudinal air outlet slots, said side plates and the lateral walls of said air chamber converge towards their free longitudinal edges and the said side plates and the said lateral walls being variable in relation to each other as to width, so that the width of the opening of said outlet slots may be varied; and air feed conduit means operatively connected to said air chamber for supplying drying air thereto.

4. Arrangement according to claim 3 in which said air chamber has two parallel outlet slots which are so spaced that the slots define, with reference to the width of the container, three equal portions.

* * * * *