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PROCESS AND APPARATUS FOR FINISHING PRESSED FIBROUS ARTICLES

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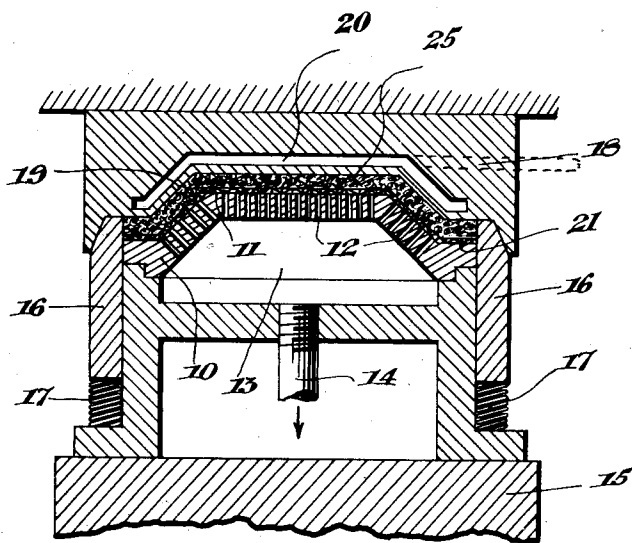


FIG. 1.

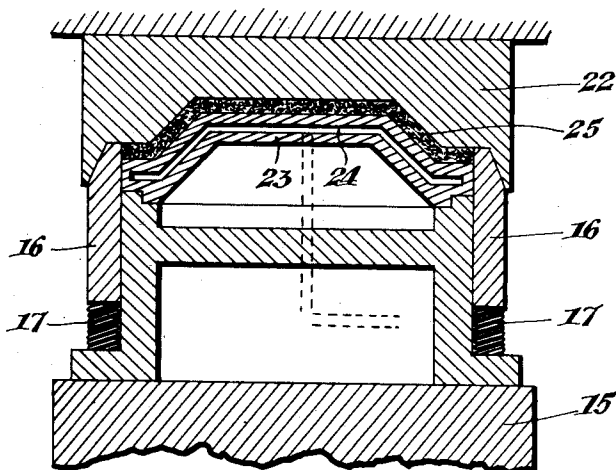


FIG. 2.

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PROCESS AND APPARATUS FOR FINISHING PRESSED FIBROUS ARTICLES

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5 Claims. (Cl. 92—54)

This invention relates to improvements in process and apparatus for finishing pressed fibrous articles and the object of the invention is to provide an improved process and apparatus for finishing pressed fibrous articles such as dishes, trays, food containers and the like and the object of the invention is to provide an improved process and apparatus for finishing articles of this character whereby a smooth surface free from drainage markings may be produced on one or more faces of the article and in which the article will be without discoloration or hydration of the fibrous stock.

The invention consists in the process and apparatus all as hereinafter more particularly described and illustrated diagrammatically in the accompanying drawing in which

Figure 1 is a vertical section through an apparatus suitable for carrying out my invention illustrating one step in the process.

Figure 2 is a vertical section of the apparatus illustrating a further step.

In the drawing like characters of reference indicate corresponding parts in the different views.

The apparatus comprises a lower die 10 provided with a forming surface 11, which surface is provided with drainage perforations 12 and beneath these drainage perforations is a suction chamber 13 and leading from this chamber 13 is a suction pipe 14. The lower die 10 could be supported so that it may be pressed with substantial pressure against the upper die in any suitable way such as by a hydraulic ram 15. Surrounding the lower die is a slidable guard 16 normally urged upwardly by springs 17.

Cooperating with the lower die (see Fig. 1) is an upper die 18 which is provided with a smooth forming surface 19 and which may be heated in any desired manner and in the form illustrated is shown provided with a heating chamber 20 to which may be lead any desired heating medium such as steam, oil or the like. The forming surface of the lower die is covered with a wire mesh cloth 21.

In Fig. 2 an unheated upper die 22 having a smooth forming surface is employed in cooperation therewith. The lower die 23 is heated in any suitable way similar to the upper die 18 in Fig. 1 and as illustrated is shown provided with a heating chamber 24.

A pressed fibrous article being finished is illustrated by the numeral 25.

The present invention relates only to the final heating step in the finishing of pressed fibrous

articles and preparatory to the introduction of the article 25 into the apparatus, as illustrated in Fig. 1, the article would have been formed in any suitable apparatus so that it is in a relatively dry state.

This article is introduced into the dies as shown in Fig. 1 and is pressed therebetween with substantial pressure so that the heated surface 19 of the upper die 18 is pressed against the article with substantial pressure and at the same time this face 19 is heated to a relatively high temperature.

The face 19 of the upper die 18 thus constitutes a calendering member which is applied to the face of the article at relatively high temperature and with substantial pressure and being smooth it produces a smooth surface on the face of the article pressed thereagainst, which face will be entirely free from drainage markings.

At the completion of the step illustrated in Fig. 1, I have produced an article which has a smooth surface on one face thereof, which surface is entirely free from drainage markings. In this step any steam or vapor which is produced may freely escape through the drainage perforations 12 in the lower die and is carried off through the suction pipe 14.

If it is desired to produce a smooth surface on both sides of the article a further step, illustrated in Fig. 2, is employed. In this case the lower die 23 has a smooth forming surface which is heated to a relatively high temperature and this smooth heated surface is applied with substantial pressure against the article and thus constitutes a calendering member which is heated to a relatively high temperature and which is applied with substantial pressure to the face of the article, with the result that a smooth surface free from drainage markings is produced on the face of the article presented to the lower die.

In this step the upper die 22 also has a smooth face, and due to the fact that the article is pressed between two smooth faces it will probably be necessary to provide some suitable means for permitting the escape of any vapour formed and this may be done by suitably arranging for a vibratory motion of the ram 15 so that the pressure between the dies may be applied intermittently and thus permit the escape of vapour from between the die surfaces.

While I have shown and described the dies 18 and 22 as provided with heating chambers to which may be fed a heating medium, my invention is not limited to any particular manner of

heating as this may be accomplished in any suitable manner.

From the foregoing it will be apparent that I have devised a novel process and apparatus for finishing pressed fibrous articles whereby the objects of my invention have been attained.

Various modifications may be made in my invention without departing from the spirit thereof or the scope of the claims and therefore the exact form of apparatus shown and described is to be taken as illustrative only and not in a limiting sense and I desire that only such limitations shall be placed thereon as shall be imposed by the prior art or are specifically set forth in the claims.

What I claim as my invention is:

1. The herein described method which comprises subjecting a preformed thin and partially dry, wet molded, pressed, fibrous article to a calendering operation at relatively high temperature and substantial pressure and exhausting by suction the vapor generated in said operation, then subjecting the article to a further calendering operation between smooth faced dies.

2. The herein described method which comprises subjecting a preformed thin and partially dry, wet molded, pressed fibrous article to a calendering operation at relatively high temperature and substantial pressure and exhausting by suction the vapor generated in said operation, then subjecting the article to a further calendering operation with heat and pressure between smooth faced dies.

3. Apparatus for finishing a preformed thin and partially dry, wet molded, pressed fibrous

article, comprising a smooth faced calendering member, means for heating said calendering member, means for applying said heated calendering member with substantial pressure to the surface of the article, suction means communicating with the article during said calendering operation, and means for subjecting the article to a further calendering operation between smooth faced dies.

4. Apparatus for finishing a preformed thin and partially dry, wet molded, pressed, fibrous article, comprising a smooth faced calendering member, means for heating said calendering member, means for applying said heated calendering member with substantial pressure to the surface of the article, suction means communicating with the article during said calendering operation, and means for subjecting the article to a further calendering operation with heat and pressure between smooth faced dies.

5. The herein described method which comprises subjecting a thin preformed and partially dry, wet molded, pressed, fibrous article to a calendering operation at a relatively high temperature and substantial pressure to calender one surface thereof, and exhausting by suction the vapor generated in said operation, then subjecting the article to a further calendering operation by applying a heated smooth faced die to the uncalendered surface, and a smooth faced unheated die to the calendered surface, and subjecting the article to substantial pressure while vibrating the dies to permit escape of the vapor generated.

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