July 14, 1964 E. JOHANSON 3,140,929

COOLING DEVICE FOR DRIED WALL-BOARD SHEETS

Filed March 10, 1960 2 Sheets-Sheet 1

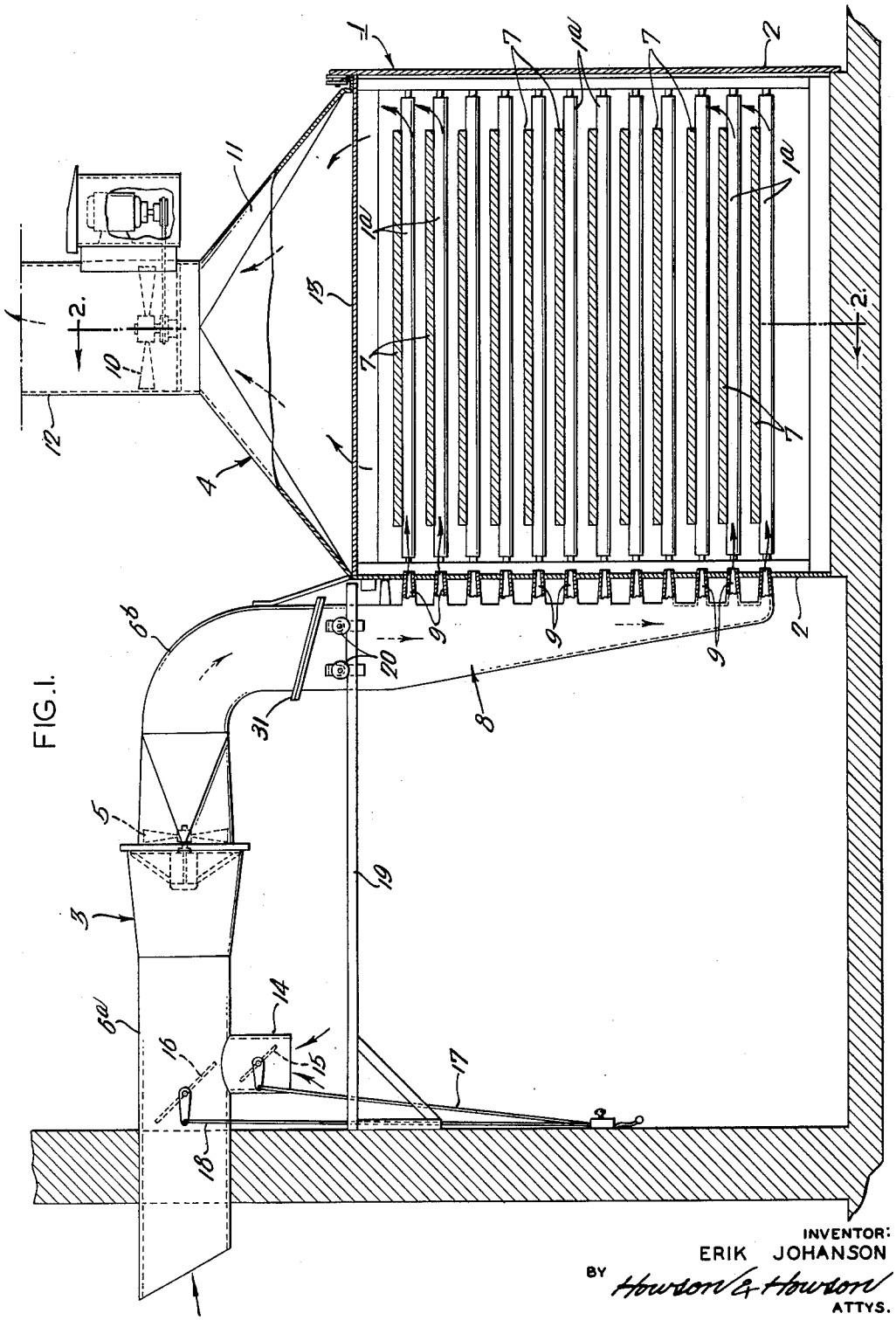


FIG. 1.

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FIG.2

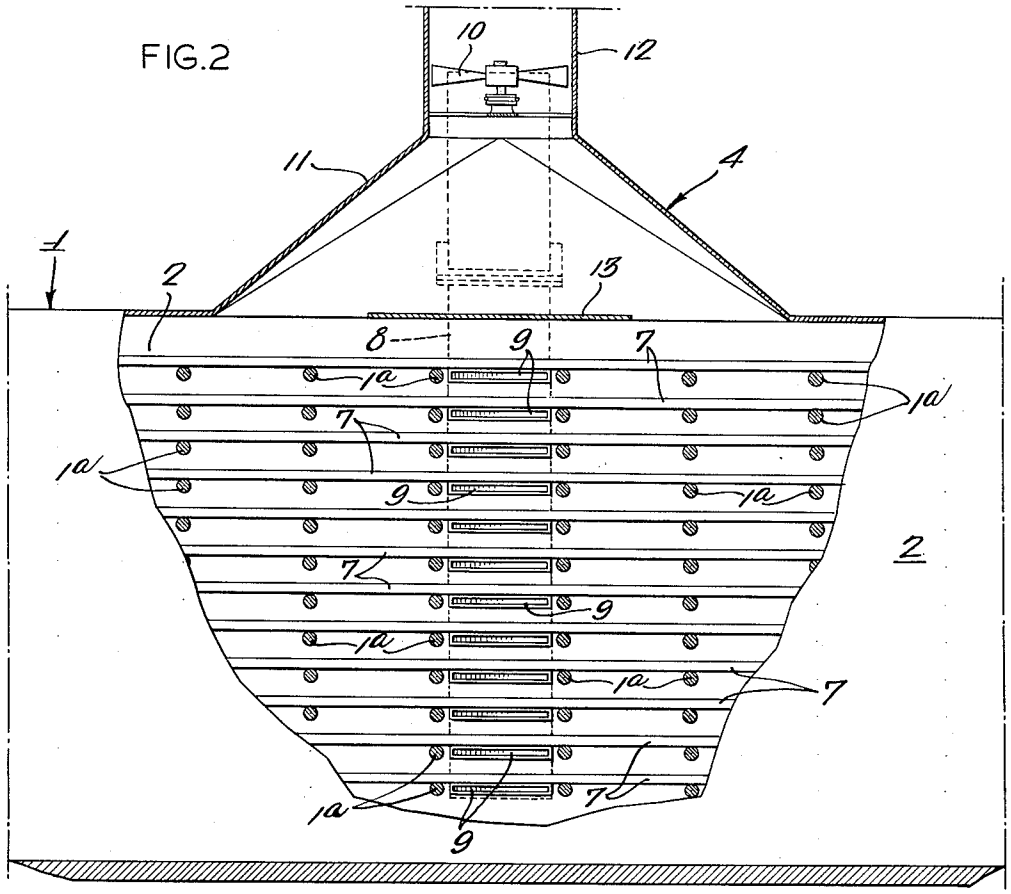
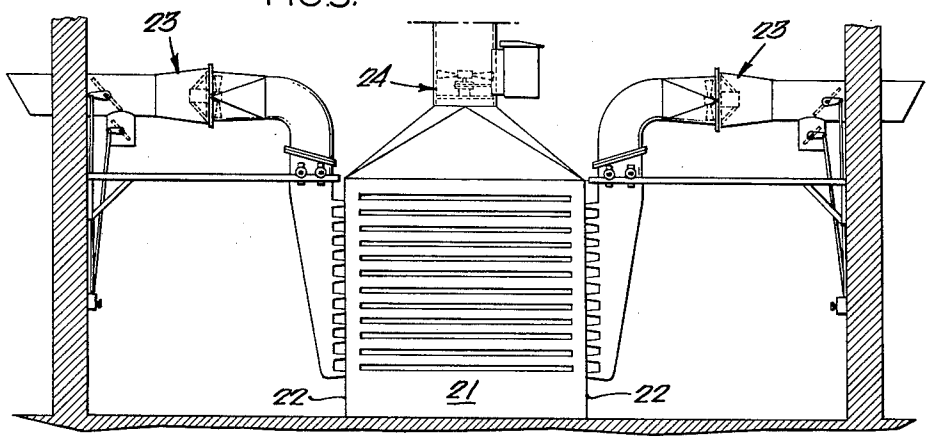


FIG.3.



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COOLING DEVICE FOR DRIED WALL-BOARD SHEETS

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The present invention relates to a cooling device for dried wall-board sheets consisting of a discharge section connected to the drying kiln, said section along its longer sides having walls shielding the section against the surrounding room atmosphere and having means for supplying discharging cooling air.

In drying wall-board sheets, the sheets discharged from the drier are cooled during their passage through the discharge section and over the conveyors to the trimming saw. It has been found, however, that this cooling is not sufficient to allow the sheets to be stacked and stored immediately after the sizing and trimming has been carried out without risk of damage to the sheets. Recently, in order to improve the cooling of the sheets, the discharge section following the drying kiln has been provided with a suction fan connected to a hood mounted above said section. The difficulty of getting the local air exhausted in this manner to impinge effectively against the wall-board sheets, however, also provides insufficient cooling of the sheets. It is an object of the invention to carry out a rapid and effective cooling of dried wall-board sheets to make possible, in this way, stacking and storing of the finished sheets without the previous risk of damage to the sheets.

The cooling device, according to the invention, is characterized in that the means for the supply of the cooling air consists of a supply fan which on its suction side is connected to a duct communicating with the atmosphere and on its pressure side is connected with an air distributing hood arranged at one side of said discharge section adjacent to the transverse end wall of the drying kiln. The hood is provided with air supply nozzles corresponding in number to the number of decks in the discharge section and pass through said side wall. The means for the discharge of the cooling air consists of a second fan designated for a somewhat greater quantity of air and connected to an exhaust hood which, in a known manner, is arranged above said discharge section. According to a preferred embodiment of the cooling device the exhaust hood is provided with a shielding plate mounted opposite the air distributing hood to prevent the supplied cooling air from being sucked directly upwards into the exhaust hood. The duct connected to the suction side of the supply fan may be provided with a connecting piece having a damper and, in addition, an adjusting damper can be arranged between said connecting piece and an inlet for outdoor air to make it possible to inject local air into the supplied cooling air. The air distributing hood is secured to a traverse track by means of wheels to make it possible when necessary to remove the air distributing hood from said discharge section and the air distributing hood by means of a quick coupling may be connected with the duct for the supply fan.

The invention will now be described more in detail with reference to the accompanying drawing figure illustrating exemplifying embodiments of the cooling device according to the invention, and wherein:

FIG. 1 is a transverse sectional view through apparatus embodying the present invention;

FIG. 2 is a longitudinal sectional view taken on the line 2—2 of FIG. 1; and

FIG. 3 is a transverse sectional view similar to FIG. 1

but a reduced scale showing a modified form of apparatus made in accordance with the present invention.

In the drawing, a discharge section **1** is connected to the drying kiln, (not shown) having a plurality of decks for supporting wall board sheets **7** one above the other and which along its longer sides is equipped with walls **2** shielding the section against the surrounding atmosphere in the room. Accordingly the discharge section **1** communicates at one end with the kiln and is open at its opposite end to the atmosphere. A number of roller tracks **1***a* are arranged above each other and correspond in number to the number of decks of said discharge section for conveying the wall-board sheets **7** which are discharged from the kiln. According to the invention, cooling air is supplied as indicated generally at **3** and is discharged as indicated at **4**. In the illustrated embodiment, a propeller fan **5** has its suction side connected to a duct **6***a* communicating with the outside atmosphere and has its pressure side, by means of a duct bend **6***b*, connected with an air distributing hood **8** arranged at one side of the discharge section mounted close to the transverse end wall of the drying kiln to supply cooling medium thereto. The hood **8** has a number of air supply nozzles **9** which pass through the side wall **2**, the number of the nozzles corresponding to the number of decks of the discharge section. A fan **10** discharges the cooling air through a duct **12** into the outside atmosphere. An exhaust hood **11** is connected to said fan **10** and is arranged above the discharge section. The hood **11** includes a shielding plate **13** located opposite the air distributing hood **8** and extending horizontally beyond the horizontal extent of the nozzles so as to prevent the supplied cooling air from being sucked directly upwards into the exhaust hood **11**. A connection piece **14** projecting from the duct **6***a* and is provided with a damper **15** and is open to the atmosphere in the room. Said damper **15** is actuated by means of an adjustment means **17**. In the same way an adjusting damper **16** is mounted for operation within the ducts **6***a* between the connection piece **14** and the inlet for the outdoor air, which damper **16** is actuated by means of an adjusting means **18**. The dampers **15** and **16** make possible a commingling of local air into the supplied cooling air. To make possible the removal of the air distributing hood **8** from said discharge section the hood is secured to a traverse track **19** by means of suitable wheels **20** and the hood is, furthermore, connected with the duct **6***b* for the supply fan by means of a quick coupling **31** of conventional design.

In order to prevent part of the cooling air from leaking into the room the fan **10** is preferably designed to withdraw a somewhat larger quantity of air than the supply fan **5**. This will cause a part of the local air to flow into the discharge section counter currently with respect to the transport direction of the sheets.

Without departing from the invention idea the supply and discharge fans can be varied with respect to their type and location.

As shown in FIG. 3, the discharge section may be provided with an air distributing hood one each of the longitudinal sides of the section. In this figure, the discharge section **21** having side walls **22** is covered by a hood connected to a duct for discharging the cooling air, as indicated generally at **24**. Cooling air is supplied through the opposite side walls **22** by supply means indicated generally at **23**. Each of the supply means **23** is similar to the supply means **3** of the previously described embodiment and need not be described in detail herein.

While particular embodiments of the present invention have been herein illustrated and described, it is not intended to limit the invention to such disclosure, but

changes and modifications may be made therein and thereto within the scope of the following claims.

What I claim is:

1. A device for cooling wall-board sheets after they have been treated in a multi-deck kiln comprising a discharge section communicating at one end with the kiln and open at its opposite end to the atmosphere, said discharge section including spaced side walls and a plurality of rollers mounted between the side walls providing supporting decks for the sheets corresponding in number to the number of decks in the kiln, an air distributing hood adjacent one of the side walls of the discharge section having a plurality of nozzles corresponding in number to the number of decks and projecting through said side wall, each of said nozzles approximately aligned with one of said decks, an air supply duct connecting said air distributing hood with the atmosphere, an air supply fan in said duct, an exhaust hood overlying said nozzles above said discharge section and in communication with said discharge section, an exhaust fan in said exhaust hood operable to exhaust a greater quantity of air than that being supplied by said supply fan so as to provide a negative pressure in said discharge section thereby preventing heat laden air from entering the atmosphere at said opposite end and, a shielding plate in said discharge section intermediate said air distributing hood and exhaust hood, said plate extending horizontally beyond the horizontal extent of said nozzles to thereby prevent the cooling air from being drawn directly into said exhaust hood.

2. A cooling device for dried wall-board sheets in accordance with claim 1 including means including a track adjacent said discharge section supporting said air distributing hood for selective movement thereof between a position adjacent said discharge section wherein said air supply nozzles project into said discharge section and a position remote from said discharge section and means detachably connecting said hood to said air supply duct.

3. A cooling device for dried wall-board sheets in accordance with claim 1 wherein said spaced side walls are confronting, and including a second air distributing hood adjacent the other of said side walls, said second air distributing hood having a plurality of nozzles corresponding in number to the number of supporting decks in said discharge section and projecting through the respective side wall, each of its associated nozzles being aligned approximately with one of said decks, and an air supply duct connecting said second air distributing hood to the atmosphere, and a second air supply fan in said duct.

4. A device according to claim 3 including means including a track adjacent said discharge section supporting at least one of said air distributing hoods for selective movement thereof between a position adjacent said discharge section wherein said air supply nozzles project through the side wall of said discharge section and a position remote from said side wall and means detachably connecting said hood to said air supply duct.

5. A device for cooling wall-board sheets after they have been treated in a multi-deck kiln comprising a discharge section communicating at one end with the kiln and open at its opposite end to the atmosphere, said discharge section including spaced side walls and a plurality of rollers mounted between the side walls providing supporting decks for the sheets corresponding in number to the number of decks in the kiln, an air distributing hood adjacent one of the side walls of the discharge section having a plurality of nozzles corresponding in number to the number of decks and projecting through said side walls, said nozzles being arranged in a vertical row and each of said nozzles being approximately aligned with one of said decks, an air supply duct connecting said air distributing hood with the atmosphere, an air supply fan in said duct, an exhaust hood in communication with said discharge section and in registry with the row of air supply nozzles, an exhaust fan in said exhaust hood operable to exhaust a greater quantity of air than that being supplied by said supply fan, and a shielding plate in said exhaust hood extending transversely to said row of nozzles intermediate the nozzles and said exhaust hood, said plate extending horizontally beyond the horizontal extent of said nozzles so as to prevent the cooling air from being drawn directly into said exhaust hood.

6. A device for cooling warp wall-board sheets after they have been treated in a multi-deck kiln comprising a discharge section communicating at one end with the kiln and open at its opposite end to the atmosphere, said discharge section including spaced side walls and a plurality of rollers mounted between the side walls providing supporting decks for the sheets corresponding in number to the number of decks in the kiln, an air distributing hood adjacent one of the side walls of the discharge section having a plurality of nozzles corresponding in number to the number of decks and projecting through said side wall, each of said nozzles approximately aligned with one of said decks, an air supply duct connecting said air distributing hood with the atmosphere, an air supply fan in said duct, a connection piece projecting from said duct upstream of said air supply fan and open to the room atmosphere, a damper in said air supply duct and connection piece, each of said dampers being actuatable selectively to thereby regulate the flow of cooling air through said duct and said connection piece, an exhaust hood arranged above said discharge section and in communication therewith, and an exhaust fan in said exhaust hood operable to exhaust a greater quantity of air than that being supplied by said supply fan so as to provide a negative pressure in said discharge section thereby preventing heat laden air from entering the atmosphere at said opposite end.

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