

D. J. O'BRIEN.
ALTERNATELY CROSS CORRUGATED PAPER.
APPLICATION FILED MAY 10, 1919.

1,360,142.

Patented Nov. 23, 1920.

Fig. 1.

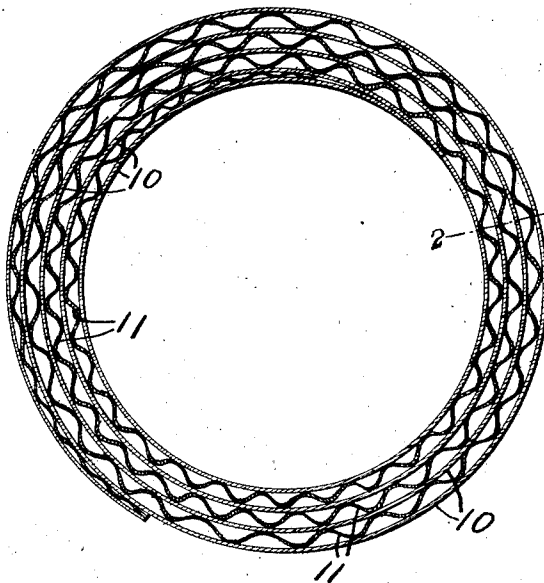


Fig. 2.

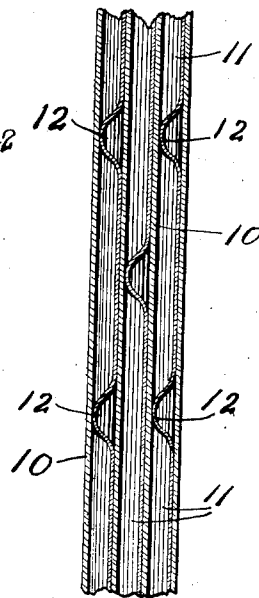
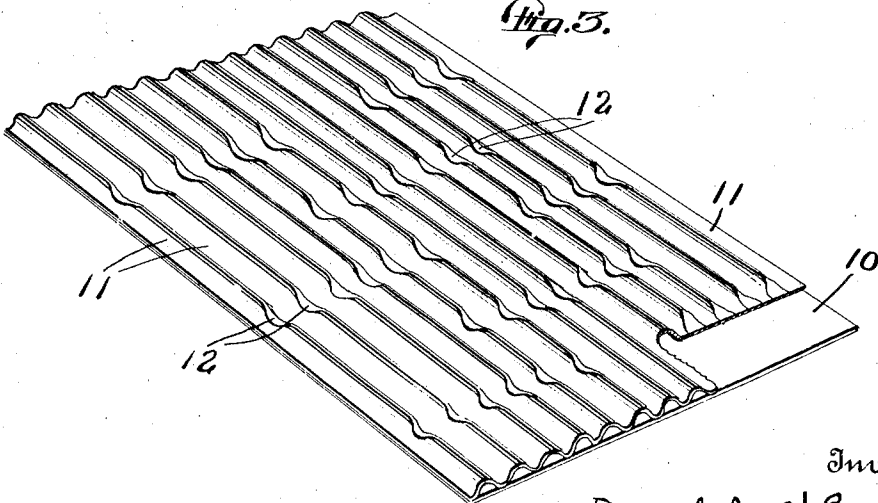


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ALTERNATELY-CROSS-CORRUGATED PAPER.

1,360,142.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DAVID J. O'BRIEN, a citizen of the United States, residing at Sheepshead Bay, in the county of Kings and State of New York, have invented certain new and useful Improvements in Alternately - Cross - Corrugated Paper; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to heat insulated containers, and more particularly to a novel construction of fiber sheet from which the container may be made.

The object of the present invention is to provide a sheet of a construction which when made up into the container will present a large number of relatively small dead air cells or spaces for insuring the heat insulation of the walls of the container.

Another object of the invention is to provide a fiber sheet of corrugated or cellular board construction which is so formed with cross corrugations as to provide relatively short dead air spaces or cells arranged in alternate rows throughout the length of the sheet of cellular board.

With these and further objects in view as will in part hereinafter be stated and in part become apparent, the invention comprises certain novel constructions, combinations and arrangements of parts as subsequently specified and claimed.

In the accompanying drawings.—

Figure 1 is a transverse section taken through the body of a container constructed of a fiber sheet manufactured according to the present invention.

Fig. 2 is a fragmentary enlarged section taken through the same substantially on the line 2—2 of Fig. 1, and showing the alternate arrangement of the cross corrugations.

Fig. 3 is a perspective view of a portion of a cellular board sheet constructed according to the present invention, parts being broken away to show the cross corrugations.

Referring to the drawing by numerals, and first to Fig. 3, the cellular board sheet comprises a base strip 10 to which is secured, by an adhesive or the like, a corrugated sheet 11, with the corrugations extending crosswise of the body strip 10. The corrugations, which may be designated generally as 11, provide air cells throughout the width

of the cellular sheet so that when the sheet is rolled spirally into the body of a container, as shown in Fig. 1, the corrugations 11 extend from end to end of the container, and provide superposed rows of dead air spaces.

It is found desirable and expedient in the formation of a practical heat insulating container of this character to break up the longitudinal air cells into relatively short air cells to lessen the liability of circulation of air through the walls of the container and to insure more perfect insulation of the walls should certain of the air cells become punctured or broken. In order to provide these relatively short air cells, and at the same time not to detract from the strength or stability of the cellular sheet which forms the wall of the container, the cellular sheet is provided with rows of cross corrugations 12 which alternate in laterally offset relation throughout the length of the sheet and which, as shown at the righthand end of Fig. 3, effect the crushing down of the corrugations 11 flat against the body strip 10 to seal the spaces within the corrugations 11 and cut off circulation of air through the corrugations. It will be noted that the rows of corrugations 12 not only alternate but slightly overlap so as to insure the cutting off or dividing up of the corrugations 11 into short dead air spaces or cells, and at the same time to provide ample uncrushed material between the rows of cross corrugations 12 to hold the cellular sheet stiff and from bending under slight pressure.

When the cellular sheet is rolled into the form of a container, the cross corrugations 12 extend circumferentially within the wall, as shown in Fig. 2, and the rows of cross corrugations are located alternately in the superposed layers which form the wall, so that the strength of the wall is not impaired or lessened at any point throughout the length and circumference of the wall. It will also be observed from Fig. 2 that the cross corrugations 12 effectually break up the long corrugations 11 into relatively short sealed spaces through which air cannot circulate and which provide efficient heat insulating means for the wall. From Fig. 3 it will be noted that the cross corrugations 12 are not in continuous lines throughout the length of the cellular sheet so that the corrugations 12 do not act as score lines to weaken the cellular sheet, but a sufficient

number of unbroken corrugations 11 remain between the interrupted rows of corrugations 12 to give sufficient strength and stability to the cellular sheet.

5 The cross corrugations may be formed in any suitable manner, one method employed being to pass the same between rollers having peripheral ribs which are of segmental form and in offset or staggered relation to the face of the roller so as to break down 10 the usual cells of the corrugated paper in lines which are offset from each other. These ribs are of sufficient depth to close the cells at the points of contact of the ribs to 15 thus form the dead air spaces variably in the cellular board structure.

What I claim is:—

1. A cellular sheet having alternate rows of cross corrugations to variably locate and 20 interrupt longitudinal dead air spaces in the cellular sheet.

2. A cellular sheet for the construction of heat insulating containers having cross corrugations arranged in alternate rows so as 25 to variably locate and interrupt longitudinal dead air spaces in the finished heat insulating container.

3. A cellular sheet for the construction of heat insulating containers comprising a body strip, a corrugated sheet secured to the face 30 of the body strip with the corrugations extending crosswise of the body strip, the corrugated strip having cross corrugations extending lengthwise of the body strip in alternating rows to break down the transverse 35

corrugations and provide sealed air spaces in the corrugations.

4. A cellular sheet for use in the construction of heat insulating containers comprising a body strip and a corrugated sheet secured to the face of the strip, said corrugated sheet being cross corrugated in interrupted alternating rows with the rows of cross corrugations overlapping to insure the breaking down of the corrugations of the 45 said corrugated sheet.

5. A cellular sheet for use in constructing heat insulating containers having transverse corrugations adapted to extend longitudinally in the finished container and having 50 cross corrugations arranged in interrupted rows with uninterrupted transverse corrugations between the rows to strengthen the cellular sheet and provided with alternating rows of cross corrugations for dividing the 55 transverse corrugations of the sheet into relatively small sealed air spaces.

6. A cellular sheet having the usual corrugations and also having cross corrugations extending at an angle to the first corrugations to close off portions of the same and 60 variably locate and interrupt longitudinal dead air spaces in the cellular sheet.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID J. O'BRIEN.

Witnesses:

VERNA O. TODD,
C. L. HILMER.