Nov. 12, 1929. A. P. JURGENSEN 1,735,684

METHOD OF MAKING AIR CELL PIPE COVERING

Original Filed Jan. 30, 1929

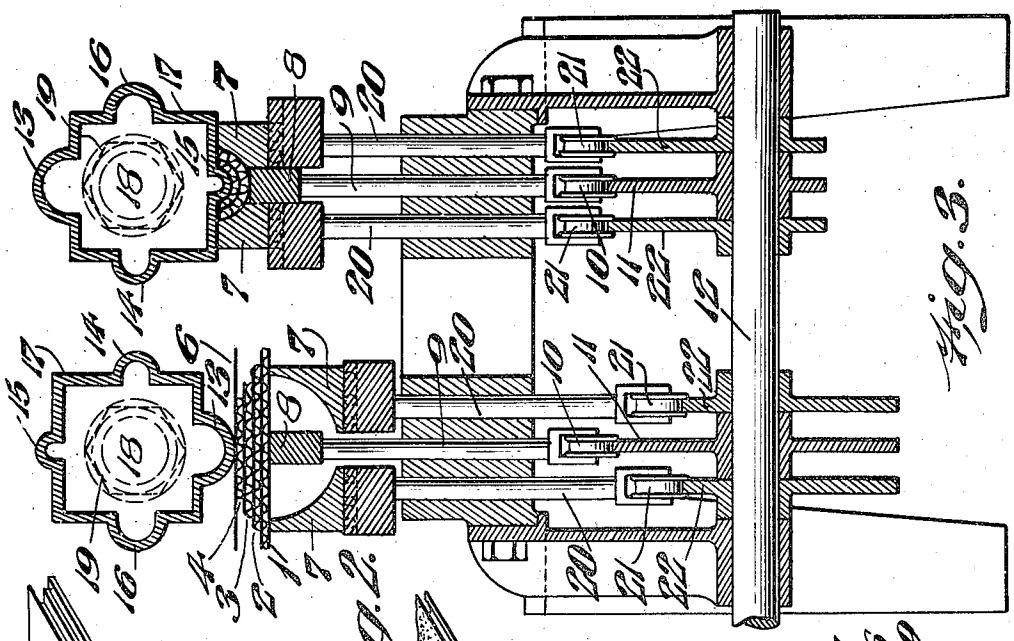


Fig. 3.

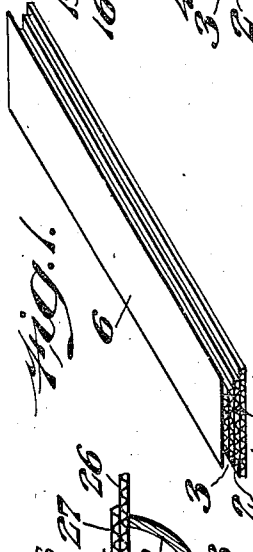


Fig. 1.

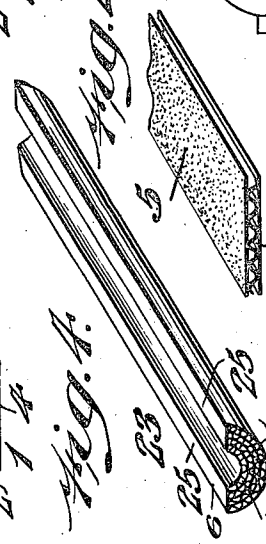


Fig. 2.

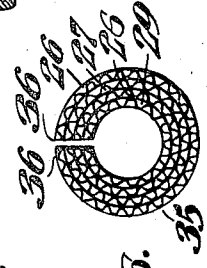


Fig. 5.

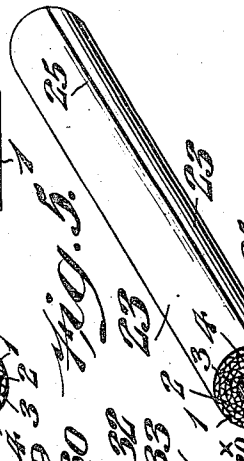


Fig. 4.

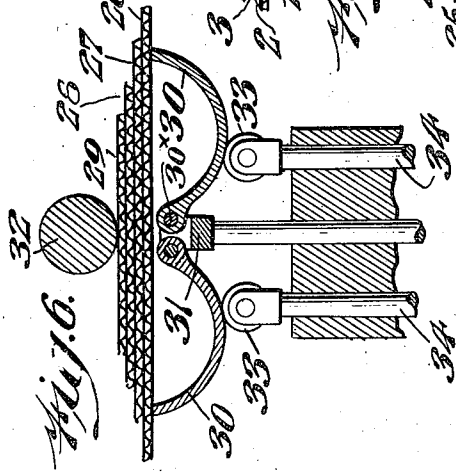


Fig. 6.

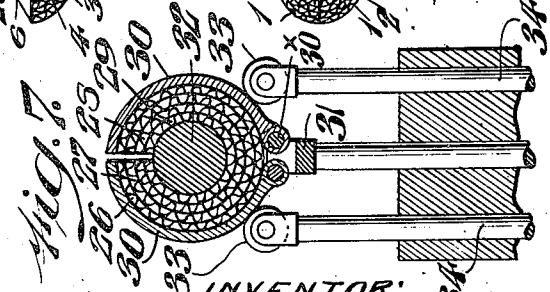


Fig. 7.

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UNITED STATES PATENT OFFICE

AUGUST P. JURGENSEN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO CONCENTRIC AIR CELLS AUTOMATIC COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF DELAWARE

METHOD OF MAKING AIR-CELL PIPE COVERING

Original application filed January 30, 1929, Serial No. 336,163. Divided and this application filed July 23, 1929. Serial No. 380,444.

My invention relates to a new and useful method of making air cell pipe covering of the type generally employed for insulating flues, steam pipes, stacks, exhaust pipes and the like, and it relates more particularly to a novel method of making such air cell pipe covering whereby a perfectly cylindrical, initially split product, which has a uniform cross section throughout, is obtained, this application being divided from my copending application Serial No. 336,163, filed January 30, 1929.

My invention further relates to a novel method whereby the cost of making insulating air cell pipe covering is materially reduced and whereby a novel product of a relatively greater cross sectional strength is obtained.

It has been the practice heretofore in forming pipe coverings of the general character described to wind or roll one continuous sheet of asbestos paper or other insulating material spirally around a core or mandrel, using silicate of soda or similar non-inflammable substance as an adhesive. By this method it was impossible to produce a perfectly round or cylindrical finish to the pipe covering since a "lap" or "joint" resulted at the beginning and at the end of the spirally rolled or wound sheet of paper.

It is the object of my invention to produce a novel air cell pipe covering in which the "lap" or "joint" in the inner and outer circumferences of the pipe covering which resulted from the spiral formation thereof is entirely eliminated.

To the above ends, my novel method consists in providing a plurality of sheets of corrugated insulating asbestos paper or the like, all of said sheets being of the same length but of gradually decreasing width, coating said sheets with a heat resisting adhesive, superimposing said sheets in pyramidal formation with the widest of said sheets at the base and the narrowest of said sheets at the top, positioning said sheets in a mould and clamping said mould about a core.

My invention further consists of various other novel steps which will be hereinafter described and claimed.

For the purpose of illustrating my novel method, I have illustrated in a fragmentary and diagrammatic manner the various steps of my novel method which I employ to produce my novel product but it is to be understood that the showing of the annexed drawings as well as the following description are merely illustrative of the scope of the invention and that the same may be altered in various respects without departing from the scope of my invention or sacrificing any of its advantages.

In the accompanying drawings:

Fig. 1, represents a perspective view showing the manner of assembling a plurality of corrugated insulating sheets ready for insertion into a mould.

Fig. 2, represents a fragmentary perspective view of a corrugated insulating sheet shown coated with a suitable heat resisting adhesive.

Fig. 3, represents a fragmentary vertical sectional view showing the steps and means involved in moulding the sheets of paper illustrated in Fig. 1.

Fig. 4, represents a perspective view of the corrugated sheets of paper shown in Fig. 1 after having been moulded as shown in Fig. 3 to form a semi-cylindrical section of my novel air cell pipe covering.

Fig. 5, represents two of the sections shown in Fig. 4 assembled to form a complete cylindrical air cell pipe covering.

Fig. 6, represents a fragmentary sectional view showing the first step in a modified method of assembling and moulding the sheets of corrugated paper shown in Figs. 1 to 5.

Fig. 7, shows the second step of my modified method.

Fig. 8, represents a cross sectional view of the finished product, moulded according to the showing of Figs. 6 and 7.

Referring to the drawings, in which like reference characters designate like parts, my novel method consists in cutting a plurality of sheets of corrugated, heat insulating material 1, 2, 3, and 4, all of the same length but of gradually decreasing width, coating said sheets with a heat resisting adhesive 5, and

superimposing said sheets with the widest sheet 1 at the bottom and the narrowest sheet 4 at the top. A top cover of canvas or similar material 6, of the same width and length as the widest bottom sheet 1, is then placed on the upper surface of the topmost corrugated sheet 4 and the entire assembly is then placed on the sectional, semi-cylindrical mould 7, see left hand portion of Fig. 3. The plunger 8, carried by the rod 9 having the roller 10 which rides on the cam 11 fast on the shaft 12, is then raised to clamp the assembled sheets of asbestos or other heat resisting material 1, 2, 3, and 4 against one of the cores or moulds 13, 14, 15, and 16 on the juxtaposed face of the core block 17 which is carried by the shaft 18 and which may be clamped in any desired position by the nut 19. The sectional moulds 7 are then simultaneously raised by the rods 20 which carry the rollers 21 which ride on the cams 22, and which are fast on the shaft 12, which is driven by any source of power, not shown. The parts are now in the position shown in the right hand portion of Fig. 3 where the mould sections 7 as well as the plunger 8 are tightly clamped against the juxtaposed core 15 of the core block 17, whereby the sheets of corrugated insulating material 1, 2, 3, and 4 are moulded into the semi-cylindrical pipe covering section 23, shown in Fig. 4. The cover or top sheet 6, of canvas or the like, forms a lining for the inner circumferential surface of the semi-cylindrical section 23 and it serves as a binder for the edges of the sheets 1, 2, 3, and 4 as at 25. When it is desired to use the air cell pipe covering thus produced and shown in Fig. 4, it is merely necessary to use a complementary pair of the sections 23 which are clamped on either side of the pipe to be insulated in the manner shown in Fig. 5.

In Fig. 6 I have shown a mould which may be employed when it is desired to adapt my novel method to the production of a complete unitary cylindrical air pipe covering shown in Fig. 8 in lieu of the sectional semi-cylindrical product illustrated in Fig. 4. In this modified form of my invention I employ a plurality of sheets of corrugated heat resisting material 26, 27, 28, and 29, with or without the canvas cover layer 6, all of the same length but of gradually decreasing width, said sheets being coated with the heat resisting adhesive 5 and superimposed upon each other in the pyramidal formation shown in Fig. 6. The sheets 26 to 29 thus assembled are then positioned on the mould sections 30 which are hinged at $30^{\times}$ and are carried by the plunger 31 which is now raised to clamp the sheets 26 to 29 against the mandrel or core 32, whereupon the moulds 30 are raised by the rollers 33 carried by the rods 34, actuated by the shaft 12 and cams 11 and 22, illustrated in Fig. 3, into the closed position illustrated in Fig. 7, thereby to mould the sheets 26 to 29 into the cylindrical air cell pipe covering 35, split at 36, see Fig. 8. By this modified form of my invention I produce a complete cylindrical, initially split air cell pipe covering which may or may not be covered externally with canvas 6 or the like.

In using the novel product illustrated in Fig. 8 the resiliency of the moulded sheets 26 to 29 is relied upon to permit the separation of the edges 36 to permit the insertion therebetween of the pipe to be insulated, or a cut may be made opposite the split edge 36 if so desired.

It will thus be seen that by cutting the plurality of sheets 1, 2, 3, and 4 and 26 to 29, of the same length but of gradually and proportionally decreasing widths I produce the novel products shown in Figs. 4 and 8, the contiguous edges 25 and 36 of which are in the same cylindrical plane, and that in lieu of the continuous, spirally formed product which was subsequently cut or split I produce a perfectly cylindrical, rounded air pipe covering which is initially split and which possesses a uniform cross section throughout.

By my novel invention the "lap" or "joint" resulting from the spiral formation of such air cell pipe covering (see Patent No. 411,091 of 1889 and No. 544,954 of 1895) is entirely eliminated.

While I have described the use of the plurality of sheets 1, 2, 3, and 4 and 26 to 29 it is to be understood that my novel method may be equally well employed for the moulding of a single sheet of the necessary thickness or of the moulding of a plastic substance if so desired.

I am aware that various attempts have been made to produce an air cell pipe covering of a uniform thickness and to avoid objectionable laps and joints due to spiral formation of such pipe coverings, but I claim to be the first to cut sheets of heat resisting material, corrugated or otherwise, into blanks of a predetermined length but of gradually decreasing widths and to superimpose said sheets in pyramidal formation to be moulded in a sectional mould to produce either a semi-cylindrical pipe covering shown in Fig. 4 or a complete cylindrical pipe covering shown in Fig. 8. The difference in width between the topmost sheet 4 or 29 and the bottom sheet 1 or 26 is equal to the difference between the inner and outer circumferences of the products shown in Figs. 4 and 8 so that the edges 25 and 36 of the pipe coverings 23 and 35 are flush or juxtaposed in the same cylindrical plane, as will be clearly understood from Figs. 5 and 8.

The various steps of coating the sheets 1 to 4 and 26 to 29 with an adhesive, feeding said sheets in pyramidal formation, raising the plungers 8 and 31 against the bottom of the said sheets, clamping the moulds 7 and 30 against the cores 31 and 32 and the re-

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moval of the finished products 23 and 35 from their respective moulds are all carried out automatically by properly timed and synchronized machinery all as disclosed in my copending application Serial No. 336,163 filed January 30, 1929, of which this application is a division.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The herein described method of forming pipe covering which consists in coating a plurality of sheets of heat resisting material of the same length but of gradually decreasing widths with an adhesive, superimposing said sheets in a pyramidal formation with the widest of said sheets at the bottom and the narrowest of said sheets on top, superimposing a sheet of fabric of the same length and width as the widest of said sheets at the top of said pyramidal formation of sheets, and moulding said sheets around a cylindrical core to form a longitudinally split cylindrical pipe covering composed of concentric, nested cylinders having their longitudinal edges parallel, juxtaposed and in the same cylindrical plane, said pipe covering being of uniform cross sectional thickness throughout.

2. The method of forming pipe covering, which consists in coating a plurality of sheets of pliable material of the same length but of gradually decreasing widths with a cement, superimposing said sheets in pyramidal formation with the widest of said sheets at the base and the narrowest of said sheets at the top, automatically superimposing a sheet of fabric of the same length and width as the widest of said sheets on the top of said pyramidal formation, feeding said superimposed and cemented sheets into a mould, automatically clamping said mould around a core to produce a transversely discontinuous cylindrical product composed of concentric nested cylinders having their longitudinal edges aligning, parallel, juxtaposed and in the same cylindrical plane, automatically releasing said mould, and lastly, automatically ejecting the moulded product from said mould.

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