Nov. 5, 1935. H. N. KNOWLTON 2,019,610

SHIPPING DRUM AND METHOD OF MAKING IT

Filed Aug. 1, 1933

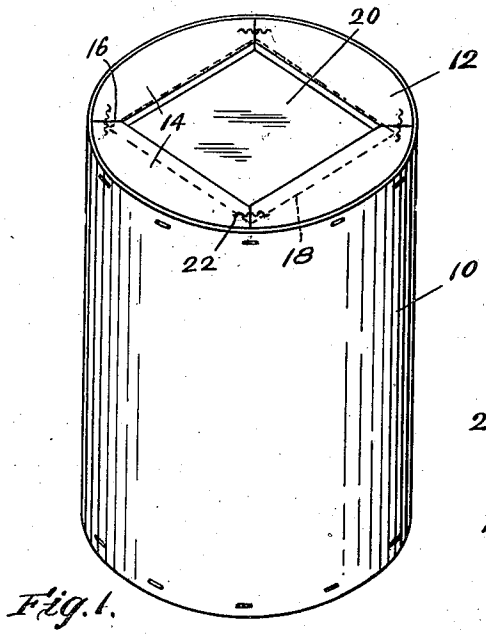


Fig. 1.

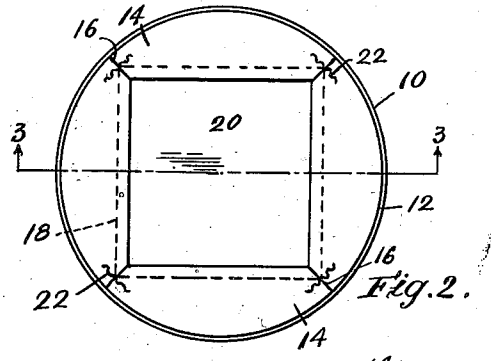


Fig. 2.

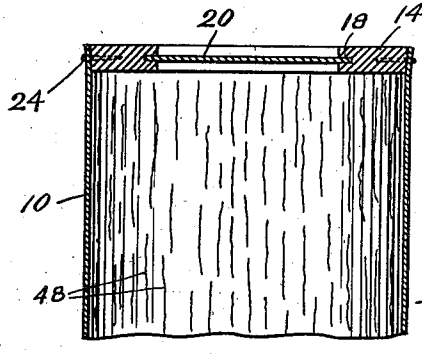


Fig. 3.

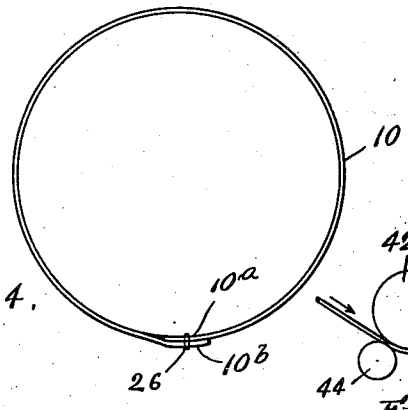


Fig. 4.

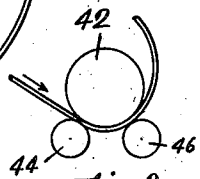


Fig. 9.

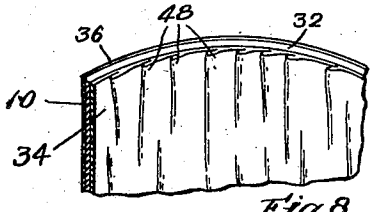


Fig. 8.

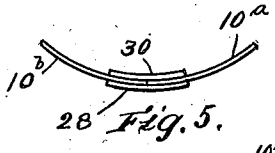


Fig. 5.

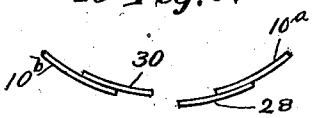


Fig. 6.

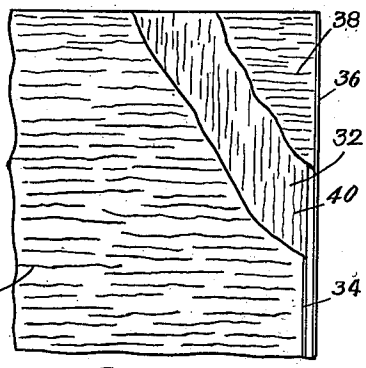


Fig. 7.

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UNITED STATES PATENT OFFICE

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SHIPPING DRUM AND METHOD OF MAKING IT

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Application August 1, 1933, Serial No. 683,158

5 Claims. (Cl. 217—1)

This invention relates to shipping drums.

One of the objects of the present invention is the provision of an improved cylindrical drum having a one piece cylindrical shell, that is cheap in manufacture, light in weight, tight, strong and rigid, and capable of being shipped empty in knock-down form so that it occupies but small space as compared with the assembled drum and thus can be shipped cheaply and can be assembled readily without special tools or knowledge.

The drum embodying my invention comprises heads of a novel construction and a cylindrical shell consisting of a composite sheet that is strong and rupture-resisting, although light in weight, and so characterized that when it has been rolled into cylindrical form it tends to retain such form permanently and has little or no tendency to straighten.

A further object is generally to improve the construction of shipping drums.

Fig. 1 is a perspective view of the shipping drum embodying the present invention.

Fig. 2 is a plan view of the drum of Fig. 1.

Fig. 3 is a section taken along line 3—3 of Fig. 2.

Fig. 4 is a plan view of the shell of the drum illustrating one of the ways for connecting the ends of the shell.

Fig. 5 is a detail showing a modified manner of connecting the ends of the shell.

Fig. 6 is a view similar to Fig. 5 but with the ends spread apart to illustrate the construction thereat.

Fig. 7 is a perspective detail illustrating the construction of the sheet that composes the shell.

Fig. 8 is a perspective detail illustrating the construction of the circular shell sheet.

Fig. 9 is a detail illustrating the manner of rolling the shell sheet.

The drum embodying the present invention comprises a cylindrical shell 10 having the ends or heads 12. Each head is composed of a plurality of segment-shaped members or cleats 14, four being here shown, having diagonally inclined faces 16 which are disposed in abutting relation. The inner faces of the head members 14 are provided with grooves 18 which register to form an endless channel in which a flat head plate 20 is retained. The frame members can be secured together by any suitable fastening means as the corrugated fastening members 22 which are driven into the adjacent frame members across the abutting faces thereof thereby retaining the head plate 20 in place without the necessity for additional attaching means. The head members are disposed within the open ends of the shell 10 and are secured to the shell by suitable fasteners as staples 24. That head member that is adapted to be placed within the shell after the drum has been packed can have a tapered peripheral portion, as illustrated in Fig. 3, to facilitate the insertion of the head within the shell.

The generic idea of this construction of an end frame for a shipping case is disclosed and claimed in my application Serial No. 683,157 filed concurrently herewith.

The shell 10 consists of a sheet of suitable dimensions formed into circular shape and having its ends secured together. In Fig. 4 the ends 10*a* and 10*b* are overlapped and are secured together by an adhesive or by staples 26 or other fastening means. In Figs. 5 and 6 a modified method of securing the ends of the shell 10 together is illustrated. In these figures one end 10*a* is provided with an attaching strip 28 that is adhesively affixed or otherwise secured to the end 10*a* and extends the length thereof and projects therebeyond. The end 10*b* is provided on its inner face with a similar sheet 30. With this construction when the ends 10*a* and 10*b* are brought into abutting relation the sheet 28 overlaps the outer face of the end 10*b* and the sheet 30 overlaps the inner face of the end 10*a*. An adhesive or other suitable means may be employed to secure the sheets 28 and 30 to the abutted ends 10*b* and 10*a* respectively.

In accordance with the present invention the drum sheet 10 is composed of a material termed "kraft wood" and is disclosed and claimed in my joint application with Boardman M. Randall, Serial No. 661,914, filed March 21, 1933. A drum having a shell composed of a kraft wood sheet is strong and rigid to resist harmful deformation or damage and yet is light in weight and relatively inexpensive. I have discovered that it has peculiar properties which make it particularly adapted for use as the shell of a shipping drum. The kraft wood sheet as illustrated especially in Fig. 7 consists of an inner core 32 of wood veneer to the outer faces of which are adhesively affixed paper sheets 34 and 36 characterized by having a pronounced grain. The paper I employ is a cylinder kraft paper which is composed of long sulphate fibres that are practically all wood fibres chemically unchanged. The cylinder kraft paper is characterized by having a pronounced grain, that is to say, the preponderance of fibres extends in one direction which in a cylinder kraft sheet is lengthwise of the sheet so that the grain runs lengthwise of the kraft wood sheet as indicated at 38. The cylinder kraft sheets and the wood veneer core are combined so that the grain 38 of the cylinder kraft sheets extends across, or runs at right angles to, the grain 40 of the wood veneer core. With this construction the cylinder kraft sheets bind the fibres of the wood veneer against rupturing so that an exceptionally strong and yet flexible composite sheet is

formed that has practically no tendency to warp or change due to ordinary atmospheric conditions. The wood veneer core may comprise a rotary cut veneer which, usually due to manufacturing limitations, is not more than six feet wide but is of indefinite length. Since the grain of the kraft wood sheet extends lengthwise of the sheet the kraft wood sheets and the veneer core can be combined in long lengths and in widths up to limits of width of the veneer and the kraft wood sheets, the grain 38 of the kraft wood sheets crossing the grain 40 of the wood veneer core. The wood veneer core can be from $\frac{1}{12}$ to $\frac{1}{20}$ inch thick and for these thicknesses the kraft wood sheets can be approximately .016 inch thick and the composite sheet composed of wood veneer and paper sheets of these thicknesses will be quite satisfactory. For a thicker veneer core thicker kraft wood sheets can be employed and for a thinner veneer core thinner kraft wood sheets can be employed, although the composite sheet built up of sheets of the dimensions given will be found satisfactory for most purposes. The shell 10 is composed of a section of kraft wood sheet constructed as above described, the width and length of the sheet being such as to form the required dimensions of the drum. The sheet is so arranged that the grain of the wood veneer core extends lengthwise of the drum or between the heads thereof while the grain of the kraft sheets extends around the drum. The shell sheet is formed into cylindrical shape by passing the flat sheet between the roller 42 and the rollers 44 and 46, see Fig. 9, which rollers are so positioned as to roll the sheet into a cylindrical form of the required diameter. Due to the peculiarity of the kraft wood sheet the rolling process contracts the cylinder kraft sheet that is on the inside of the shell so that it becomes shorter than the other cylinder wood sheet and the veneer core and holds the kraft wood sheet in the cylindrical shape imparted to it by the rolls. The rolls act on the inner cylinder kraft sheet 34 to contract it by forming a series of folds 48 therein, see Figs. 3 and 8, some of the fibres of the sheet overlapping other fibres so that the length of the sheet 34 is permanently reduced. The formation of the folds 48 appears to take place without any discernible detachment of the cylinder kraft sheet from the wood veneer core. Neither the outer cylinder kraft sheets 36 nor the veneer core 32 are deformed, although there may have been a stretching of the outer cylinder kraft sheet 36. The folds 48 are not continuous from end to end of the shell but exist as a series of short discontinuous folds that occur at more or less intervals around the inner circumference of the shell. The folds cause the shell to retain the circular shape imparted to it by the rolls so that when the ends of the shell are brought together there is no harmful tendency for the ends to spread apart.

The head plates 20 preferably are composed of flat sheets of kraft wood constructed as above described.

The drum is adapted to be shipped to the user in knock-down form, a series of rolled drum shells 10 having their ends free, being nested one within the other to economize shipping space. The drums are assembled by the user by securing the ends of the shells together and inserting the heads in the manner above described.

I claim:

1. A shipping drum including a cylindrical shell comprising a sheet of kraft wood characterized by having an inner core of wood veneer and outer cylinder kraft sheets adhesively affixed to the opposite faces of the core sheet, the grain of the wood veneer core extending lengthwise of the shell and the grain of the paper sheets crossing the grain of the wood veneer core, the innermost cylinder kraft sheet of the shell having a series of folds which extend lengthwise of the shell and which retain the kraft wood sheet permanently in its cylindrical configuration.

2. A shipping drum including a cylindrical shell comprising a sheet of kraft wood characterized by having an inner core of wood veneer and outer cylinder kraft sheets adhesively affixed to the opposite faces of the core sheet, the grain of the wood veneer core extending lengthwise of the shell and the grain of the paper sheets crossing the grain of the wood veneer core, the innermost cylinder kraft sheet having some of its fibres displaced from their position in the flat sheet and disposed in overlapping relation whereby to hold the shell permanently in its cylindrical configuration.

3. The method of constructing a shipping drum having a cylindrical shell composed of a sheet of kraft wood having an inner wood veneer core the grain of which extends lengthwise of the shell and sheets of cylinder kraft paper affixed to the opposite faces of the wood veneer core and having their grain crossing the grain of the wood veneer core, which method comprises forming the sheet into permanent cylindrical shape by rolling the sheet under pressure and displacing fibres of the cylinder kraft sheet that form the inside of the shell over other fibres thereof to permanently shorten the length of the inner cylinder kraft sheet whereby to cause it to hold the kraft wood sheet permanently into cylindrical form.

4. The method of constructing a shipping drum having a cylindrical shell composed of a sheet of kraft wood having an inner wood veneer core the grain of which extends lengthwise of the shell, and sheets of cylinder kraft paper affixed to the opposite faces of the wood veneer core and having their grain crossing the grain of the wood veneer core, which method comprises forming the sheet into permanent cylindrical shape by imparting to that cylinder kraft sheet that forms the inner face of the shell a series of folds that are spaced around the shell and extend lengthwise of the shell whereby permanently to shorten the length of the innermost sheet and thereby retain the shell into its cylindrical configuration.

5. The method of forming into permanently retained cylindrical configuration a composite sheet comprising a wood veneer core and paper sheets adhesively affixed to the opposite faces of the core sheet and having grain that crosses the grain of the core sheet, which method comprises rolling the composite sheet lengthwise the grain of the paper sheets and crosswise the grain of the core sheet and permanently shortening the length of the inner sheet by displacing fibres of the inner paper sheet in a series of spaced folds which traverse the grain of the inner paper sheet.

HARRY N. KNOWLTON.