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L. F. HALL

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PAPER CONE ROLLING APPARATUS

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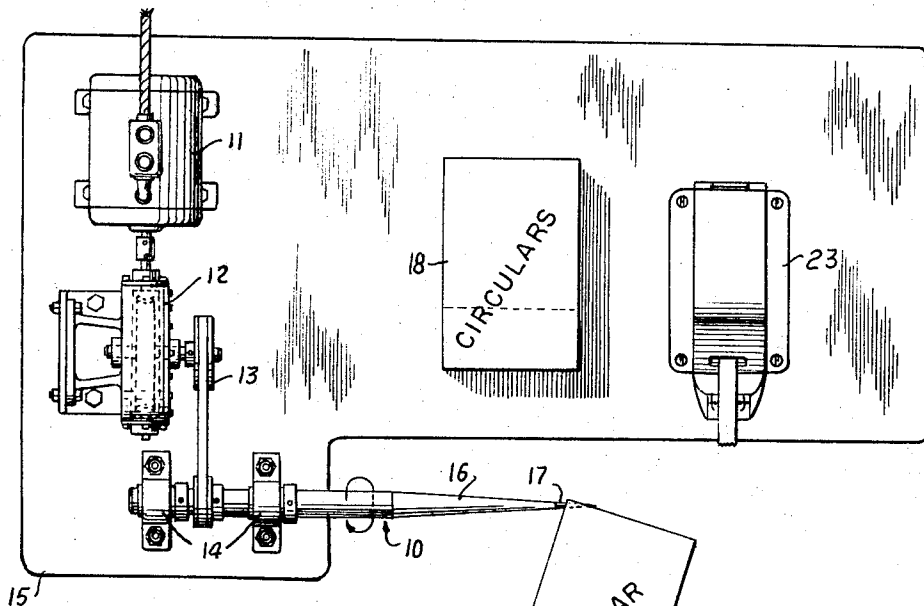


Fig. 1

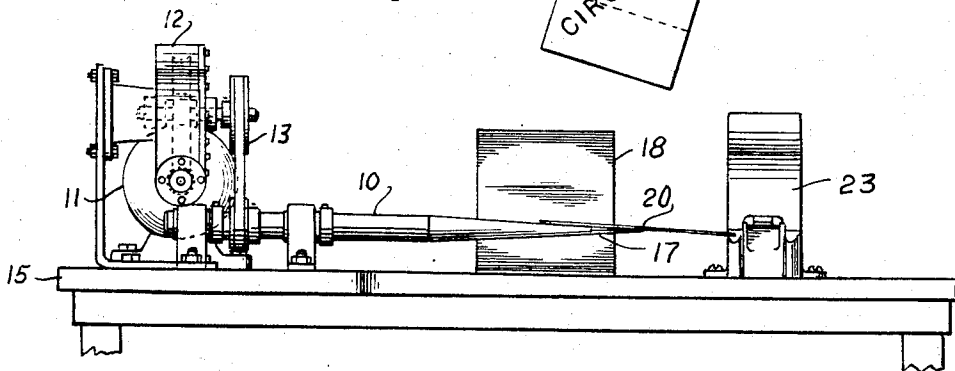


Fig. 2

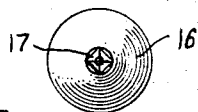


Fig. 3



Fig. 4

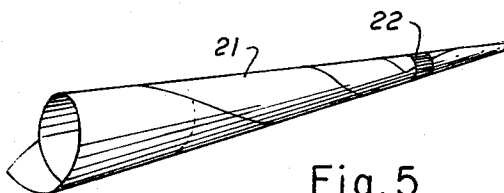


Fig. 5

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## ABSTRACT OF THE DISCLOSURE

This application discloses apparatus for rolling paper cones including a cone-shaped, continuously rotated, spindle which is shaped at its tip to facilitate gripping of a corner of a sheet of paper which is to be rolled into a cone. The shaping of the tip of the spindle is such that the rolled cones may be easily removed. The apparatus is essentially manually operated.

In my copending application Ser. No. 606,856, filed Jan. 3, 1967, now Patent No. 3,345,977 entitled Projector Apparatus for Paper Cones, there is disclosed a gun-like device for distributing advertising material in residential areas, the material being in the form of rolled paper cones. The objective of the apparatus disclosed in said copending application is to provide an inexpensive yet accurate technique for distributing paper circulars or leaflets. The technique must be inexpensive since the material must be delivered in quantities of many, many thousands to achieve a useful return, and must be accurate in that the paper will be delivered near the front door-step of each house in the residential areas, increasing the likelihood that the material will be picked up and read. The apparatus disclosed in said copending application provides a uniquely effective technique for distributing this material, but required that the cones of paper be prepared such that all of the cones be almost exactly the same size and shape, and also necessitates the production of very large quantities of such cones by an inexpensive method.

Cone rolling machines previously manufactured have been generally unsuitable for the purpose just described because either an especially shaped paper is needed or the spindle upon which the cone is formed requires a clamp or slit for holding the paper to start shaping the cone. In the latter situation, production of cones is necessarily slow because the spindle must be stopped to operate the clamp or insert the edge of the paper in the slit. This step of stopping the spindle detracts from the speed of operation quite markedly.

It is the principal object of the invention to provide a technique and apparatus for manufacturing paper cones in an inexpensive yet accurate manner, this manufacturing technique requiring operators with a minimum of skill and training. Particularly, it is an object to provide a paper cone rolling technique using a rotating spindle wherein it is not necessary to stop the spindle to initiate rolling the cone.

In accordance with this invention, there is provided apparatus for manufacturing paper cones in what is essentially a manual operation. A spindle is rotated at a suitable speed which may be perhaps a few hundred r.p.m., with the end of the spindle being cone-shaped to define a form around which the cone is rolled. The top of the spindle is shaped so that an operator may place the corner of a sheet of paper around the tip and apply manual pressure to start the paper winding around the spindle. The shaping of the tip is preferably smooth in a longitudinal direction so that the paper cone may be easily removed from the spindle when completed. The rotating spindle may be mounted in a manner such that a supply of the sheets of paper is readily available, and a tape dispenser

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is readily at hand for providing short lengths of tape to apply to the cones to hold them in place.

The novel features believed characteristic of this invention are set forth in the appended claims. The invention itself, however, as well as other objects and advantages thereof, will be best understood by reference to the following detailed description of a particular embodiment, read in conjunction with the accompanying drawing, wherein:

FIGURE 1 is a plan view of apparatus for rolling paper cones according to the invention;

FIGURE 2 is a front elevation view of the apparatus of FIGURE 1;

FIGURE 3 is an enlarged end view of the spindle in the apparatus of FIGURE 1;

FIGURE 4 is a side view of the end of the spindle as in FIGURE 3; and

FIGURE 5 is a pictorial view of one of the cones rolled on the apparatus as illustrated in FIGURES 1-4.

With reference now to FIGURES 1 and 2, apparatus is shown for rapid, accurate and repeatable production of paper cones with a very simple piece of equipment requiring a relatively unskilled operator. Basically, the apparatus comprises a spindle 10 which is rotated in the direction indicated by an electric motor 11 which is coupled through a reduction gear 12 and a pulley arrangement 13 to turn the spindle. The shaft of the spindle 10 is supported by a pair of bearings 14. The speed of the motor 11 and the various ratios in the reduction gear 12 and pulley 13 are such that the spindle 10 is rotated continuously at a fairly slow speed, perhaps about 300 r.p.m. It will be noted that the spindle drive arrangement including the motor and gear is mounted on a suitable table or support 15 in a manner such that the spindle 10 projects out over a cut-out space whereby the operator will have freedom of movement.

The spindle 10 is shaped to define a cone-shaped portion 16 which is of the same size and shape as the desired finished product. The length of the cone-shaped portion 16 is at least as long or longer than the paper cone which is to be rolled thereon. Thus, there will be a firm base for rolling the cone from one end to the other so that the paper cones will be the same size each time. The end of the cone-shaped portion of the spindle 10 is a shaped tip 17 which is an important feature of the invention, aiding in gripping the paper and starting the formation of the cone as will be explained in detail below.

In operating the apparatus of FIGURES 1 and 2, a person would be seated facing the spindle 10 and would have convenient access to a stack of paper sheets 18, this being the material to be rolled into cones. Ordinarily this material would consist of sheets of paper or very light paper-board, of the type used for advertising circulars. Usually one end of the sheet is a return post card, with the sheet being scored or perforated to permit tearing off the return card. The remainder of the sheet would contain the usual advertising matter. The operator manually picks up from the stack 18 one of the sheets 20 with the left hand and places the upper left-hand edge of the sheet over the tip 17. This edge or corner of the paper is folded or lapped around the tip 17 then gently pinched or squeezed by the operator between thumb and forefinger of the right hand. This is sufficient to grip the edge of the paper and begin to turn the paper and lap it around the spindle 16 to form a cone. Of course the tip of the paper cone turns or slips between the thumb and forefinger of the operator. When the sheet 20 has been completely wrapped around the spindle 16 to form a cone 21, as generally seen in FIGURE 5, the operator releases the pinching grip on the tip of the cone and pulls the cone away from the spindle, it being noted that the shape of the tip 17 permits the cone to be easily withdrawn from the spindle

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but yet holds the edge of the paper for turning. The operator then places a short length of masking tape 22 or the like around the cone 21, as seen in FIGURE 5. The length of tape is obtained from a conveniently placed tape dispenser 23 which may be of conventional form as illustrated or may be a device which dispenses a precut length of tape, preferably the latter for fast operation.

In order to avoid having a sharp point on the cones an indicia is provided near the top of the spindle 10 to provide a guide for the operator in starting the paper. A sharp pointed cone is undesirable in that when projected at high speed against a screen door it may stick in the screen. Accordingly, the cones are rolled with a blunt tip, i.e. with a hole in the end of the cone, to avoid this problem. To this end, a mark may be placed on the spindle, or preferably the tip of the spindle is cut off at 24 as seen in FIGURE 4, giving the operator a reference as to where to start the paper.

With the apparatus and method just described, the average operator after a few minutes instruction and a few hours practice can obtain a rate of at least 1,000 per hour or more. Ordinarily the completed cones would be stacked one on top of the another on a large number of upright dowels located on a board immediately to the right of the right-hand corner of the support 15.

With reference to FIGURES 3 and 4, it will be noted that the tip 17 of the cone-shaped portion 16 of the spindle is shaped to define four flat sides which are effective when the spindle is turning to grip the corner of the paper when the operator squeezes the corner around the tip 17. It is understood of course that a knurled or serrated tip would perform this function. However, to permit ease of removal of the completed cone from the rotating spindle, it is preferable that the shaping of the tip 17 be a flat sided arrangement rather than being knurled or the like.

While the paper cone rolling apparatus has been described above with reference to a specific embodiment, it is of course understood that this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiment, as well as other embodiments of the invention, will be apparent to a person skilled in the art upon reference to this application.

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It is therefore contemplated that the appended claims will cover any such modifications or embodiments as fall within the true scope of the invention.

What is claimed is:

1. Apparatus for use in manufacturing paper cones by primarily a manual operation comprising: a spindle having a cone-shaped end thereon, the length of the cone-shaped portion being at least about as long as the paper cone to be rolled, drive means for continuously rotating the spindle at a speed of several revolutions per second, means positioned near the spindle for holding a supply of paper sheets each of which is to be rolled into a cone whereby an operator may readily place the sheets one at a time in a rapid manner over the tip of the spindle for rolling into cones, the tip of the spindle being shaped to define a plurality of surfaces departing from a cone shape whereby a corner of each of said sheets when lapped around said tip and manually squeezed will grip the spindle and rapidly roll the sheet round the spindle to form a cone, the shaping of the tip being generally smooth in a longitudinal direction to facilitate removal of the paper cone from the spindle, and means positioned adjacent the spindle for dispensing to the operator a length of tape to be applied to each paper cone to hold its shape.

2. Apparatus according to claim 1 wherein the spindle is shaped to define a plurality of flat sides.

3. Apparatus according to claim 1 wherein the tip of the spindle is truncated a short distance from what would be the tip thereof to provide a guide for the operator in placing the corner of a sheet thereon whereby a blunt tipped cone may be rolled.

4. Apparatus according to claim 1 wherein an indicia is provided adjacent the tip of the spindle to provide a guide for the operator in placing the corner of a sheet thereon whereby a blunt tipped cone may be rolled.

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BERNARD STICKNEY, *Primary Examiner*.