

Dec. 2, 1969

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3,481,075

FLOWER SHIPPING CONTAINER

Original Filed May 5, 1967

3 Sheets-Sheet 1

FIG. 1

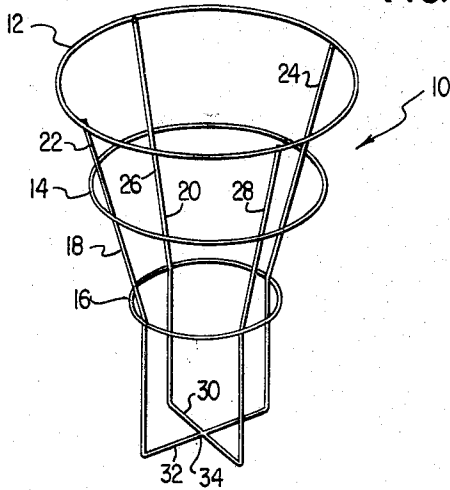


FIG. 2

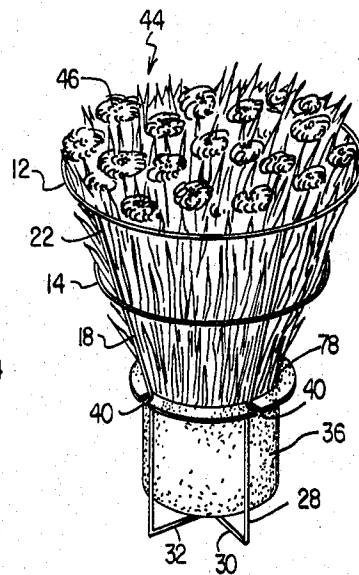


FIG. 3

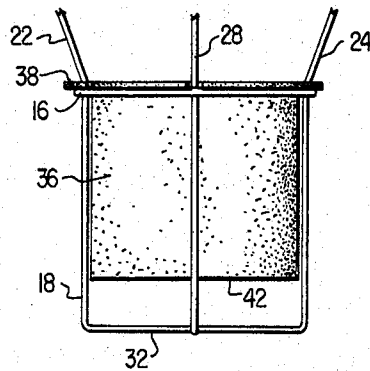


FIG. 4

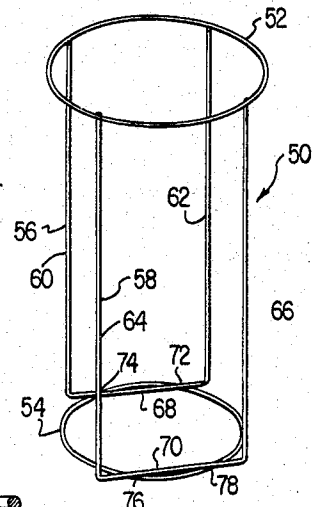


FIG. 5

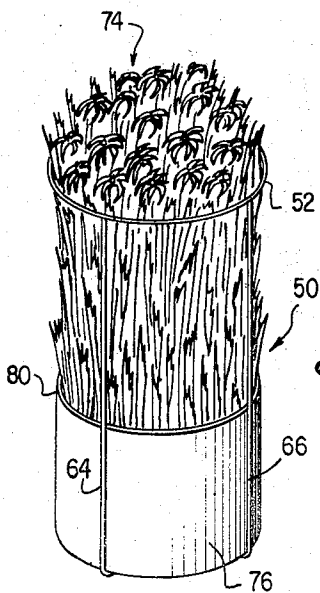
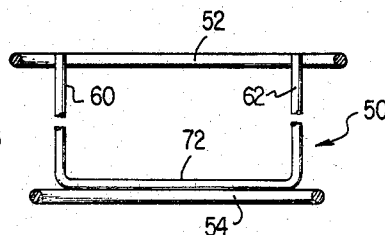


FIG. 6



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FIG. 7

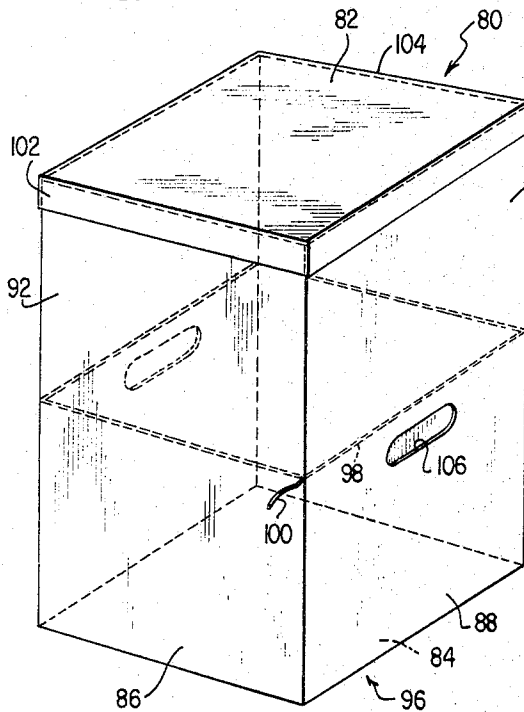


FIG. 8

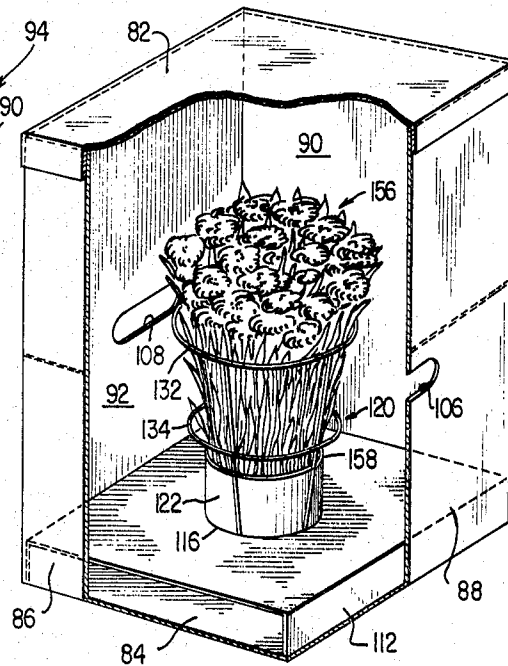


FIG. 9

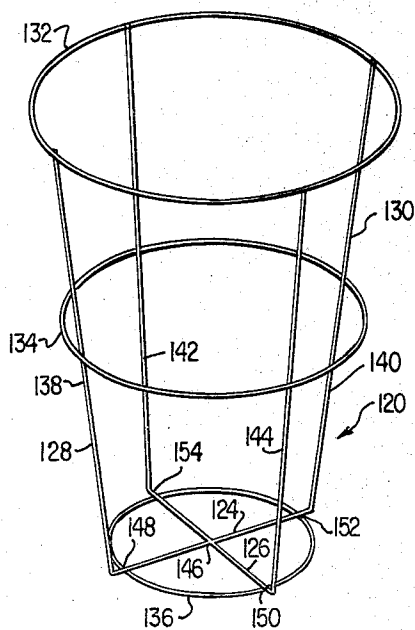
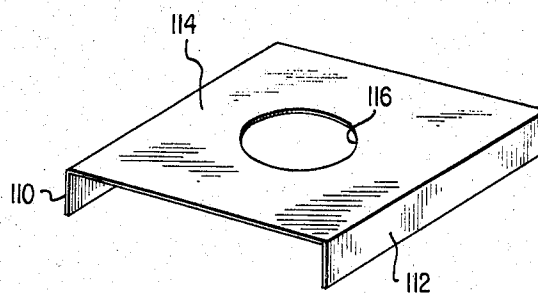


FIG. 10



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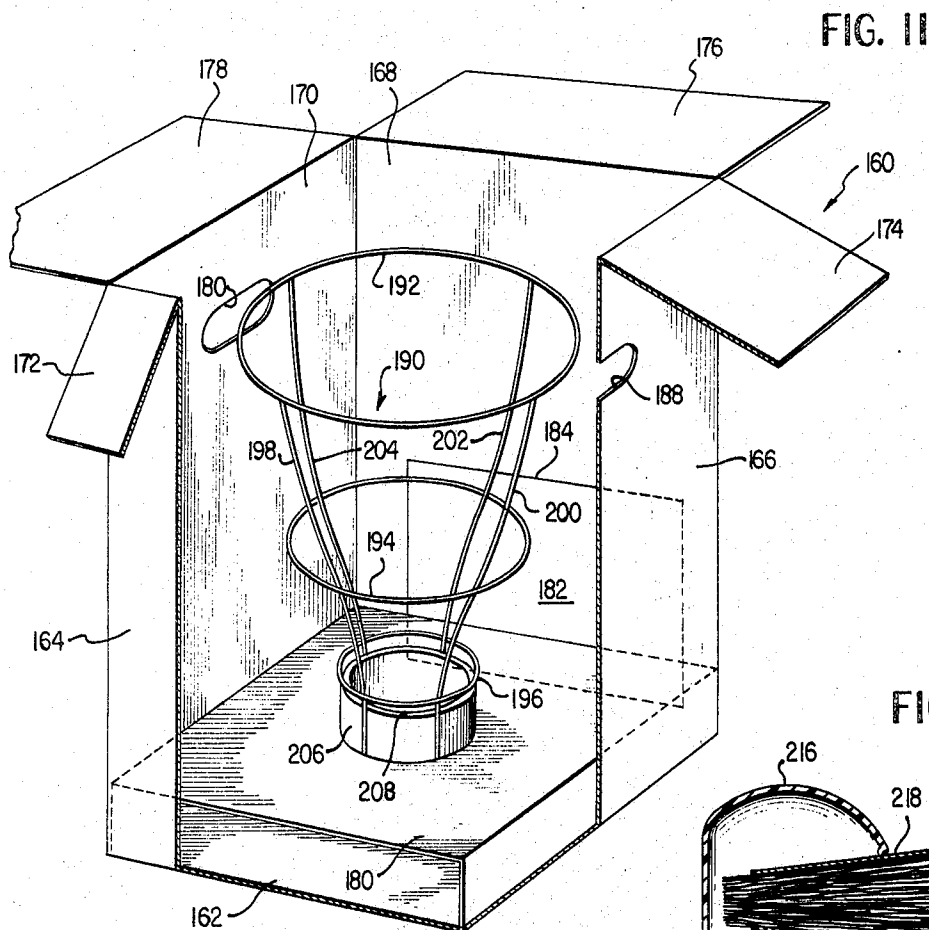
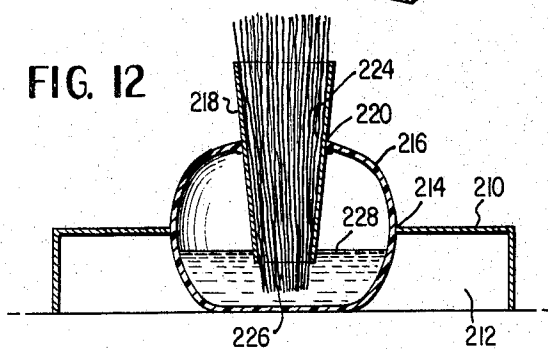
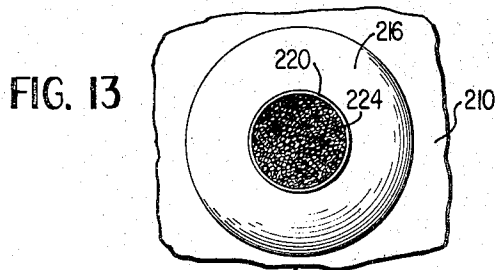
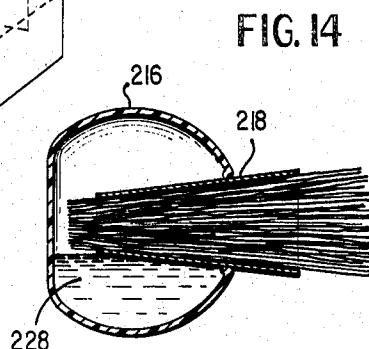
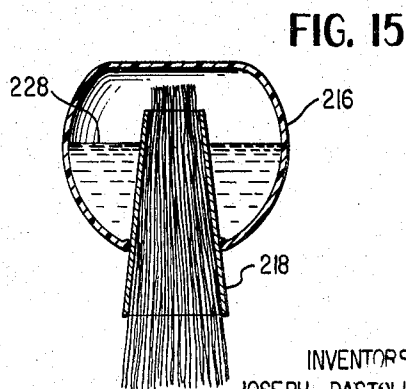
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FLOWER SHIPPING CONTAINER

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3 Sheets-Sheet 3



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FLOWER SHIPPING CONTAINER

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Continuation of application Ser. No. 453,331, May 5, 1967. This application July 31, 1967, Ser. No. 657,422 Int. Cl. A01g 5/00; A47g 47/02

U.S. Cl. 47—41

4 Claims

ABSTRACT OF THE DISCLOSURE

There is disclosed herein an improved method and apparatus for shipping cut flowers in a liquid medium, employing a water-filled container having a filling opening and having inserted therein a sufficient number of cut flowers so that the stems substantially fill the opening. The water in the container tends to be partially absorbed into the stems of the cut flowers which causes radial expansion of the stems to further seal the container opening against spillage of liquid. Suitable flower retaining means preferably in the form of a wire structure having one or more rings is associated with the container to prevent excess movement of the portions of the flowers extending beyond the container opening. The above-described arrangement is contained in an outer protective shipping package during transportation.

The present application is a continuation of copending application Ser. No. 453,331, filed May 5, 1965 and now abandoned.

This invention relates to a novel shipping container and to a method of shipping cut flowers which substantially increases the freshness of the flowers when received at the point of destination, and hence substantially prolongs the useful life of the flowers. An important feature of the present invention is the provision of an arrangement for supplying substantial amounts of life-giving water and other nutrients (if desired) to the flowers immediately after cutting, and at all times during shipment. At the same time, the problems of water spillage and water loss are minimized. These advantages are obtained through the use of the relatively simplified and inexpensive shipping container which does not substantially increase shipping costs over presently practiced methods. In conjunction with the improved container of this invention, there is provided a novel method of handling the cut flowers which substantially reduces the labor cost of packaging and shipping the flowers.

While the shipping container and the shipping method described are applicable to all types of cut flowers, the invention will be specifically described in conjunction with pom-poms (belonging to the mum family) as processed and shipped to commercial florists. Under current practices it usually takes about 36 hours from the time of cutting for the cut flowers to reach and be put on display or otherwise stored by the retail florist in the city or town of destination. At the hot-house, farm, or other establishment at which the flowers are grown, they are conventionally cut and placed in pots or pails of water for overnight storage. Customarily, sometime during the next day, the flowers are removed from the water pots, thoroughly wetted down, and then placed in cardboard or other suitable shipping containers. The flowers are conventionally laid on their sides in bunches, and the heads of the blooms are ordinarily covered by a paper sleeve to protect the bloom.

After the flowers are packed for shipping, they are usually transported from the grower in refrigerated trucks,

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very often to an air terminal where they may be shipped to distant points by air freight. Modern transportation facilities make it possible to keep the flowers refrigerated during most if not all of the time of transportation from the grower to the retail florist. When received by the retail florist, the flowers are removed from the shipping container and again placed in water, either for storage or display, until such time as they are sold to the customer. As mentioned above, the total time of travel to a store for display while varying widely depending upon the distance and upon the method of transportation is usually estimated in the florist business in terms of approximately 1½ days, i.e., 36 hours.

Several important disadvantages accompany the above-described conventional mode of shipping cut flowers. One of the most serious of the difficulties is the attendant loss of life of the flower due to a lack of a sufficient amount of water during shipment. Even though this lack of water between transmittal and receipt of the flowers is for what might be considered a fairly short time, the significant amount of drying out of the stems that occurs cannot be completely compensated for by subsequently placing the flowers in water at the point of destination. Like most living things, once a flower is cut and left relatively dry for any significant period, the mucous in the stem of the flower tends to coagulate and to harden. This process is for the most part irreversible, and acts to substantially lessen the drawing qualities of the stem, even though the flower may be subsequently placed in an adequate amount of water. The flower is therefore upon receipt necessarily not nearly as fresh as when originally cut.

A second disadvantage of the conventional mode of shipment resides in the excessive handling required to ship the flowers. The flowers are not only cut and generally stored in water at the grower's establishment, but also are later packed and then removed at the point of destination, and again stored in water until sold. This repeated handling of the flowers not only increases the likelihood of damage but significantly increases the cost of shipping due to the substantial labor involved.

A third significant disadvantage accompanying modern shipping methods involves the fact that the flowers, when placed on their sides in the box, are free to move at least longitudinally within the box during shipment. As is well known, most containers undergo a certain amount of jostling and movement during shipping, causing the flowers within the box to move and repeatedly strike the box end. It has been found that when the cut ends of the stems are repeatedly bumped against the ends of the shipping box, there is a tendency for this bumping or pounding of the stems against the end of the cardboard or paper box to act to seal the cut end of the flowers. This has been found to also substantially lessen the water drawing qualities of the stems when they are replaced in water at the point of destination. This, of course, may be avoided by re-cutting the stems, but this not only lessens the length of the stems, and hence the desirability of the flowers, but also necessitates additional handling and the attendant costs and likelihood of damage.

In order to avoid at least some of the difficulties mentioned above, it has been proposed in the past to insert the cut ends of the flower stems during shipping into a suitable water retaining holder, such as a sponge or a block of artificial sponge material. In addition to water, it has been proposed to wet the sponge with a suitable nutrient liquid, in some cases referred to as "petal life." However, this method of shipping too presents difficulties, and insofar as applicant is aware, has not been accepted to any large degree by the flower growing or florist industry. One of the difficulties is that cut flowers tend to draw a sub-

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stantial amount of water, and hence require during shipment more water than can be reasonably soaked up and retained by a sponge. In addition, the insertion of the flower stems into the sponge necessitates additional handling of the flowers with the attendant cost and likelihood of damage. Finally, sponge held stems which are retained in the sponge material for a substantial length of time are subject to being damaged by the sponge itself, once the sponge material becomes relatively dry. That is, if the flowers are retained by the sponge material a time sufficient for the sponge to become relatively dry, then the sponge has a tendency to pull water out of the flower, thus reversing the desired effect.

The present invention relates to a novel shipping container and a method of handling cut flowers, which completely avoids the above-mentioned problems. In the present invention the flowers as soon as they are cut are placed directly in a shipping container, which is provided with a sufficient amount of water at all times during shipment and even subsequently to supply the necessary amount of water to keep the flowers fresh for several days. The shipping container is provided with a suitable plastic, waxed or impregnated paper, metal, or other type of pail or bucket which will hold water without leakage. The flowers, as soon as they are cut, are bunched together and their stems inserted into the open mouth of the container. The bunch of flowers is chosen large enough so that the stems, when bunched together, completely fill the open mouth of the container so as to prevent leakage of water in the event that the container is inverted or otherwise tipped or jostled during shipment.

The stems of the flowers are not inserted all the way down to the bottom of the container, but rather are preferably inserted to a point where the cut ends of the flowers are spaced somewhat from the container bottom. This assures that the cut ends will properly draw water and will not bump against or engage the bottom of the container so as to induce the undesired stem-end sealing described above. Once the flowers have been inserted, the stems are tightly held not only by the open mouth of the container, but also preferably at a second circumferential point spaced upwardly of the stems, i.e., underneath but adjacent the blossoms, by a suitable wire support within the shipping container.

Since the flowers are placed in the container in a relatively dry state, the initial draw of water from the container is fairly substantial. For example, if the bucket in the shipping container is initially approximately $\frac{3}{4}$ filled with water, the initial overnight draw of water through the stems will reduce the water level in the bucket to approximately $\frac{1}{2}$ full. This initial draw of water by the dry cut flowers causes the stems to swell, thus even more tightly binding the stems within the container so as to avoid longitudinal as well as lateral movement of the stems and acting more tightly to seal the open top of the container against leakage between the swelled flower stems.

Upon receipt at the point of destination, the flowers may be kept within the container which is still at least partially filled with water, until such time as they are sold. The retaining bands around the swelled stems may be cut away and the individual flowers or flower bunches easily slid out or pulled from the container for sale and distribution. Thus, it can be seen that several handling steps are completely eliminated by the present invention while at the same time the flowers are continuously retained in a bucket of life-giving fluid.

It is, therefore, one object of the present invention to provide a novel shipping container for cut flowers.

Another object of the present invention is to provide a novel method of shipping cut flowers.

Another object of the present invention is to provide a shipping container for cut flowers having a water retainer in the form of a water-proof bucket adapted to hold the cut ends of the flowers.

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Another object of the present invention is to provide a novel cut flower shipping method wherein the flowers are immediately inserted into a shipping container in the cut or relatively dry state, and retained in this container throughout their travel from the grower to the point of destination.

Another object of the present invention is to provide a shipping container having binding means for retaining the swelled stems of cut flowers against movement within a shipping container during transport.

Another object of the present invention is to provide an improved water-resistant bucket for incorporation in a shipping container for cut flowers.

Another object of the present invention is to provide an improved method which substantially reduces the amount of handling accompanying the transport of cut flowers from the grower to their destination. At the same time the flowers are retained in water and are held against undesired movement during jostling of the container so as to substantially increase their freshness at the point of arrival. During this time, the flowers themselves, i.e., the lower portion of the stems, are received in a bunch through the open top of the shipping container bucket so that the swelled stems of the flowers act as a water seal preventing leakage of water from the container during transport.

These and further objects and advantages of the invention will be more apparent upon reference to the following specification, claims, and appended drawings wherein:

FIGURE 1 is a perspective view showing one form of a wire retainer or basket for cut flowers.

FIGURE 2 is a similar view, showing several bunches of cut flowers with their stems received in a water-proof bucket, supported by the wire basket of FIGURE 1.

FIGURE 3 is an enlarged view of the bucket and lower end of the wire basket of FIGURE 2.

FIGURE 4 shows a modified cut flower wire retainer or basket.

FIGURE 5 is a view similar to FIGURE 2 showing the flowers and a modified bucket held by the retainer of FIGURE 4.

FIGURE 6 is an enlarged view of a portion of the lower end of the wire retainer of FIGURE 4.

FIGURE 7 is a perspective view showing a cut flower shipping container constructed in accordance with the present invention.

FIGURE 8 is a view similar to that of FIGURE 7 with a portion of the shipping container cut away, showing the cut flowers supported in the container.

FIGURE 9 is a perspective view showing a still further modified form of the wire retainer usable in the container of FIGURE 7.

FIGURE 10 is a perspective view of a riser insert for the shipping container of FIGURES 7 and 8.

FIGURE 11 is a perspective view, with parts broken away, of a modified shipping container constructed in accordance with the present invention.

FIGURE 12 is a vertical section through the shipping container riser showing a modified water-retaining bucket constructed in accordance with the present invention.

FIGURE 13 is a plan view of a portion of the insert and the water bucket of FIGURE 12 and;

FIGURES 14 and 15 are views of the bucket shown in FIGURE 12, tipped 90° and 180° respectively from the vertical position of FIGURE 12.

Referring to the drawings, one form of wire retainer or basket constructed in accordance with the present invention is illustrated at 10 in FIGURE 1. This basket comprises 3-spaced metal wire rings 12, 14 and 16, all having different diameters and all lying in horizontal planes, each joined to a pair of generally U-shaped vertical braces 18 and 20. Each of the braces 18 and 20 is provided with a pair of vertical arms, 22, 24, 26 and 28, respectively. Each of these arms is joined to each of the rings 12, 14 and 16 by suitable means such as weld-

ing or soldering at the juncture points as illustrated. The vertical braces also include base portions 30 and 32 which are similarly joined to each other at their juncture point 34 by welding or soldering.

Referring to FIGURES 2 and 3, the basket 10 is adapted to receive a cylindrical water proof bucket 36 formed of light weight plastic, metal, waxed or impregnated paper, or any other similar material capable of holding water for several days. Bucket 36 is provided with a rim 38 at its upper end adapted to be received over and rest against the lower wire ring 16. Rim 38 is notched out as is illustrated at 40 in FIGURE 2 to provide clearance for the vertical arms of the braces 18 and 20. Ring 16 of the basket is preferably spaced from the base elements 30 and 32, a distance slightly greater than the depth of the bucket 36 so that the bottom 42 of the bucket is spaced from the bottom of the basket 10.

The basket and bucket are adapted to be filled with several bunches of cut flowers illustrated at 44 in FIGURE 2. The blossoms 46 of the flowers are customarily covered with a protective paper sleeve (not shown) and the flowers have relatively long stems extending downwardly into the bucket 36 but terminating short of the bucket bottom 42. In the preferred embodiment, bucket 36 is made of a suitable transparent material, such as a transparent plastic, so that the position of the lower end of the stems and the water level in the bucket may be ascertained at all times.

FIGURE 4 illustrates a modified basket construction 50 wherein the basket comprises an upper metallic wire ring 52 and lower ring 54 welded, soldered, or otherwise suitably joined to a pair of vertical wire braces 56 and 58. Braces 56 and 58 again are of generally U-shaped configuration, including vertical arms 60 and 62 and 64 and 66 respectively. The vertical arms are joined by integral base portions 68 and 70. Each is joined at two spaced points 72 and 74, 76 and 78 to the lower wire ring 54.

FIGURE 5 illustrates the basket 50 of FIGURE 4 as holding several bunches of cut flowers illustrated at 74 in FIGURE 5. These flowers may be similar to those illustrated at 44 in FIGURE 2, and have the lower ends of their stems received in a cylindrical water proof bucket 76, resting on the base portions 68 and 70 of the wire basket 50. As in the previous embodiment, the lower ends of the stems are preferably spaced slightly from the bottom of the bucket 76, and the bucket may be formed of the same material as the bucket 36 in FIGURE 3. While the arrangement of FIGURES 4 through 6 does not provide quite as much protection for the flowers and stems as the embodiment of FIGURES 1-3, it is a simpler and less expensive construction, and in some instances may be desired over the previously described embodiment of FIGURES 1-3.

An important feature common to both the above described embodiments of the invention is that the buckets 36 and 76 are preferably filled approximately $\frac{3}{4}$ full of water prior to the insertion of the lower ends of the stems into the bucket. The number of flowers, i.e., several bunches, are chosen such that the stems may be inserted through the open mouth 78 of bucket 36 in FIGURE 2, or through the open mouth 80 of the bucket 76 in FIGURE 5, with the stems taking up enough space to substantially completely fill the open mouth of the respective buckets. The flowers are placed in the buckets preferably as soon as they are cut at the growing establishment so that the flower stems are relatively dry. While the stems should substantially completely fill the open mouth of the bucket so as to avoid any excessive leakage of water should the basket or bucket be inadvertently tipped or turned over, the initial insertion of the flower stems should not be in such a quantity as to unduly compress and damage the flower stems. Once the flowers are inserted into the bucket within the wire basket retainer, the flowers are conventionally held at the growing establish-

ment for shipping the next day. Due to their relative dryness, there is a substantial initial draw of water through the stems of the flowers from the bucket from approximately $\frac{3}{4}$ full to approximately $\frac{1}{2}$ full. This initial draw of water is accompanied by substantial swelling of the flower stems which acts to tightly seal the stems within the open mouth 78 or 80 of the respective buckets. This swelling, however, is not of a nature as to cause any damage to the flower stems or to detract from their ability to further draw water from the bucket.

The size of the wire baskets and buckets is of course chosen in accordance with the type and number of flowers being shipped. Preferably, the diameter of the upper ring 12 in FIGURE 2 and of the upper ring 52 in FIGURE 5 is chosen so that the upper ends of the stems close to but slightly below the blossoms 44 and 74 are also fairly tightly held after the stems have swollen under the influence of the first overnight draw of water. In this way the flower stems are tightly held at two spaced points, i.e., the mouth of the bucket and the upper ring, so that the flowers are restrained without damage against any longitudinal movement which might tend to bring the lower ends of the stems into contact with the bottom of the bucket, from which they are spaced. The center ring 14 of the embodiment of FIGURES 1-3 is primarily for reinforcing the basket and may or may not be used to further bind the flower stems as desired.

FIGURES 7 and 8 illustrate a shipping container constructed in accordance with the present invention, usable with the wire basket and bucket arrangements of FIGURES 1-3, FIGURES 4-6, or with the modified basket and bucket arrangement illustrated in FIGURES 8 and 9. FIGURE 10 illustrates a cardboard type of riser insert incorporated into the container of FIGURES 7 and 8.

Referring to those figures, the shipping container 80 comprises a rectangular box of cardboard or other suitable shipping material having a top 82 and a bottom 84 joined by four vertical side walls 86, 88, 90 and 92. The box is preferably formed in two separable sections, i.e., a top section 94 and a bottom section 96, joined by a tear strip 98, holding a rip cord 100, extending completely around the juncture of the two box sections. By pulling on the exposed end of the rip cord 100, the tear strip may be torn away completely around the four sides of the box so that the two sections may be separated, and the flowers if desired removed from the bottom section 98.

A lid or a top 82 is provided with a downwardly extending flange 102 adapted to overlie the upper edges of the vertical side walls, and may be suitably joined to the side walls by mucilage, tape, staples, or any other conventional fastening means. As illustrated, lid 102 is completely removable from the top of the box so that the flowers may be inserted (and removed, if desired) through the open top of the box. Alternatively, the lid 82 may be hinged to one of the vertical side walls of the box, for example, as indicated at 104 in FIGURE 7. Each of the side walls 88 and 92 is preferably provided with elongated cutouts 106 and 108, preferably in the lower section 96, providing hand grips by means of which the box may be lifted and carried or moved around before, during, and after shipment.

Resting on the bottom 84 of the box are the spaced vertical flanges 110 and 112 of insert or riser 114 illustrated in more detail in FIGURE 10. Riser 114 is provided with a central circular aperture 116 adapted to tightly receive the lower end of a still further modified wire basket 120, constructed in accordance with the present invention and illustrated at 120 in FIGURES 8 and 9. Basket 120 as opposed to the previous embodiments is uniformly tapered to present a truncated conical configuration for reception of a similarly tapered, i.e., truncated conical shaped water bucket 122 illustrated in FIGURE 8. This bucket, except for its tapered configuration, is otherwise similar to the bucket 76 of FIGURE 5 and rests on the joined base elements 124 and 126 of a pair of generally U-shaped vertical

braces 128 and 130, forming a part of the basket 120 of FIGURE 9. The basket again comprises three spaced wire rings 132, 134 and 136, as before welded, soldered or otherwise suitably joined to the U-shaped braces 128 and 130. These latter elements are provided with generally vertical arms 138, 140, 142 and 144, respectively, formed integral with the respective base portions 124 and 126. These latter elements are joined to each other as indicated at 144 in FIGURE 9 and are further joined to a lower ring 136 at contact points 148, 150, 152 and 154. Received in the basket 120 within the container 80 as illustrated in FIGURE 8 are several bunches of flowers indicated at 156.

An advantage in the construction of the tapered bucket 122 and its correspondingly tapered basket 120 is that with the corresponding tapers of these two elements, chosen properly in accordance with the size and number of flowers to be transmitted, the lower ends of the flower stems tend to bunch together as the flowers are inserted into the bucket 122. The taper is preferably chosen so that the flower stems become properly bunched when the flower stems, that is, the cut ends of the stems, are still slightly spaced above the bottom of the bucket 122. As before, the bucket is initially filled about $\frac{3}{4}$ full with water prior to insertion of the flowers. Aperture 116 in the riser 114 is similarly chosen of sufficient diameter to tightly engage the arms 138, 140, 142 and 144 of the tapered basket when the basket rests on the bottom 84 of the container. Riser 114 in this way acts to position the entire basket-bucket-flower assembly against lateral movement within the shipping container 80. At the same time, the expansion or swelling of the stems in drawing water from the bucket acts to tightly seal the stems at the open bucket mouth 158 and preferably also, but to a lesser extent, at the upper ring 132 of the basket. Additional retention is provided by intermediate ring 134, but the primary purpose of this ring is to reinforce the wire basket itself.

FIGURE 11 shows a still further modified shipping container assembly wherein the retaining wire basket is of an overall curved configuration to provide a more pronounced taper adjacent the lower end of the stems, i.e., those portions of the stems received in the water bucket. In this embodiment, the shipping container 160 again comprises a rectangular box of cardboard or other similar shipping material having a bottom 162 integrally joined to four vertical side walls 164, 166, 168 and 170. Integrally joined to each of these side walls are corresponding flaps 172, 174, 176 and 178 which when overlapped and suitably joined form a cover for the container. Incorporated within the container and resting on the bottom 162 is a riser 180 in all respects similar to riser 114 of FIGURE 10. Side wall 168 of the shipping container is preferably provided with a large flap 182 hinged at its top as indicated at 184 for access to the interior of the container. That is, with the tapered construction of the basket illustrated, substantial unused space exists within the shipping container, and in some cases it is desirable to insert additional material or horticultural instruments such as fertilizer, wire-cutters, or the like into the unused space. This is particularly desirable when the flowers travel through the more expensive routes, such as by air freight, where space is at a premium and it is desirable to utilize all possible space within the shipping container. Cutouts 186 and 188 are preferably provided as before in the side walls 166 and 170 to provide hand grips for lifting and maneuvering the shipping container 160.

Received within shipping container 160 is a modified wire basket 190 comprising three spaced wire rings, 192, 194 and 196. These wire rings are suitably joined in manners previously described to the generally vertical arms 198, 200, 202 and 204, of a pair of generally U-shaped vertical braces of the type previously described in the aforementioned embodiments. The lower end of

the wire basket may be constructed in the manner of any of the previous embodiments, i.e., may comprise simply the criss-crossed base members of FIGURE 1, the ring juncture of FIGURE 4, or the combination criss-cross and ring juncture of that illustrated in FIGURE 9. The important feature of the modification illustrated in FIGURE 11 is that the upwardly extending arms 198, 200, 202 and 204 of the vertical arm braces are curved or contoured in the manner illustrated in that figure to provide a more drastic taper of the basket towards its lower end, i.e., that portion of the basket receiving water bucket 206. In the embodiment of FIGURE 11, the water bucket 206 is similar to the bucket 76 of FIGURE 5, i.e., is of straight cylindrical construction, having a closed bottom and an open top 208. The bucket rests on and is supported by the base of the wire basket 190 which in turn rests upon the bottom 163 of shipping container 160. In the embodiment of FIGURE 11, the wire basket and surrounding rings 190, 194 and 196 act to progressively gather together the stems of the flowers as they are dropped through the basket into the bucket 206 so that upon slight swelling, the stems are tightly retained by the open mouth 208 of the bucket to prevent excessive leakage of water from the bucket in the event the container is tilted, turned over or inverted during shipping. Again, the flowers are preferably inserted into the bucket such that the lower or cut ends of the flowers are slightly spaced above the bottom of the bucket while at the same time always being immersed in the water in the bucket.

FIGURES 12 and 13 illustrate a modified construction for a water bucket in accordance with the present invention. In this embodiment there is shown a riser 210 resting on the bottom 212 of the shipping container which may be of the type illustrated in FIGURES 7 and 8 or of the type illustrated in FIGURE 11. Riser 210 is in all respects similar to the risers 114 and 180 previously described, and include a central aperture 214 receiving a water bucket 216. In this embodiment, no wire basket is utilized within the shipping container, but rather the flower stems are received in and positioned by a tapered, truncated conical sleeve 218 received through the open mouth 220 of the water bucket 216. Water bucket 216 is shaped in the form of a circular globe or a sphere, but in addition to the open mouth or aperture 220, is provided with a flat bottom 222 on the side of the sphere opposite mouth 220. Received through the sleeve 218 are the stems 224 of the flower bunches which stems are compressed by the sleeve such that the cut ends 226 terminate short of, that is, are spaced slightly above the bottom 222 of the water bucket so that they may adequately draw water from the bucket. The swelling of the stem from the first initial overnight draw of water causes the stems to swell and become fairly tightly compacted, as illustrated in FIGURE 13, so as to seal off the mouth 220 against the loss of water.

An additional feature of the bucket embodiment of FIGURES 12 and 13, is in the spherical nature of the water bucket 216 in conjunction with the removable sleeve 218. The sleeve may be constructed of suitable material such as plastic, impregnated paper, metal or the like, and preferably is provided with sufficient rigidity and some flexibility such that it may be pressed down into the mouth 220 of the water bucket so as to be slightly frictionally retained against withdrawal. Expansion of the stems in drawing water from the bucket further enhances the engagement of the sleeve with the open mouth 220 of the bucket producing a wedging action which further retains the sleeve in the open mouth. Alternatively the sleeve may be permanently attached to the bucket by suitable adhesive or the like.

Sleeve 218 preferably extends about $\frac{2}{3}$ of the way down into the water bucket 216 so that if the shipping container is inadvertently tipped as in FIGURE 14 or completely inverted as in FIGURE 15 the sleeve also acts to prevent water from escaping from the bucket.

These figures illustrate the bucket as slightly less than half full, as might be the case during actual shipment of the container, i.e., after the initial draw of water during the customary overnight stand at the flower growing establishment. This typical water level is illustrated at 228 in FIGURE 12, and FIGURES 14 and 15 illustrate the action of the sleeve in preventing escape of water from the water bucket. As the flowers are tipped from the vertical position of FIGURE 12 to the horizontal position of FIGURE 14, water circulates around the sphere, always remaining at the gravitational lower side of the sphere. Water is prevented from escaping by the inwardly projecting tapered portion of the sleeve, i.e., that portion within the water bucket. Complete inversion of the flowers, as might happen during shipment, still does not produce any escape of water which is prevented not only by the swelled stems but also by the projecting sleeve in the manner illustrated in FIGURE 15.

As is apparent from the above, the present invention provides a novel method and apparatus for shipping cut flowers, particularly over large distances which may take several hours or even several days. Important features of the present invention include the fact that the lower ends or cut stems of the flowers are always immersed in water during the complete shipping operation. Additional features include the fact that the shipping container permits a method whereby handling of the flowers is minimized, thus substantially decreasing the cost of the shipment and the likelihood of damage to the flowers. The flower stems are compressed into the open mouth of the bucket so as to prevent water leakage, even if the bucket should be tipped or inverted during shipping. This sealing action of the stems is enhanced by the swelling of the stems in drawing water from the bucket and to this effect the flowers are preferably placed in the bucket without any initial wetting.

The flowers may be inserted directly into the shipping containers at time of cutting, or at least into the water buckets and the surrounding wire baskets if a basket is used. It is apparent that the wire baskets and water bucket provide independent supports for the flower bunches, prior to such time that they are inserted into the shipping container. Similarly, the bunches may be removed from the cardboard container at the point of destination and the wire basket assemblies and buckets again afford independent supports for the flower bunches externally of the shipping container which supports may be used for the purposes of display or for temporary storage. In disassembling the bunches, the surrounding wire loops are preferably cut away so that the individual stems may be slid out of the buckets containing the water. The number of flower stems inserted into each bucket should be carefully chosen in accordance with bucket size so as to produce the desired compression, but should not be of an excessive number so that the stems are compressed to the extent that they are damaged.

Typical dimensions for the cardboard or corrugated shipping containers of the present invention are 32 inches high, 18 inches wide, and 20 inches deep. Containers of this type are adapted for the shipping of pom-poms having stems in the neighborhood of 26 or 27 inches long. Typical dimensions for a wire basket used with these flowers is a top ring having a diameter of 16 inches, a center ring having a 12 inch diameter, a bottom or a bucket ring having a 9 inch diameter, and a base ring such as ring 136 of FIGURE 9 having a 7 inch diameter. As previously mentioned, in certain embodiments the 12 inch diameter center ring is omitted. The overall height of the basket is preferably about 21 inches, and in the preferred construction the U-shaped reinforcing members cross in the manner illustrated by elements 124 and 126 in FIGURE 9. The riser plate preferably is 18 inches by 20 inches to completely fill the bottom of the shipping container, and preferably has 6 inch flaps to provide a 6 inch rise in the bottom of the box.

In the embodiment illustrated in FIGURES 12-15, the water bucket 216 may typically have a spherical diameter of 14 inches. In this construction the sleeve 218 may have an upper end diameter of 8 inches, uniformly tapering to a lower diameter submerged in the water 228 of approximately 7 inches. The diameter of open mouth 220 is preferably in the neighborhood of $7\frac{2}{3}$ inches. Typical dimensions for a tapered water bucket usable with the basket of FIGURE 9 is a bucket of truncated, conical shape, 10 inches high and having an upper diameter of 8 inches and a bottom diameter of 7 inches.

While the invention has been described in conjunction with specific flowers, it is apparent that it has general utility for use in conjunction with almost all types of cut flowers having elongated stems. In some instances the wire baskets may be eliminated and the water buckets used to support the flowers in conjunction with the stabilizing effect of the risers, thus completely eliminating the necessity for wire baskets. This is especially true if the shipping container itself is modified to have a tapered construction so as to tightly retain the upper ends of the flower bunches. By way of example, 20 bunches of pom-poms having the dimensions indicated above may be shipped in one of the containers described. Similarly, while the shipping containers have been described in conjunction with top openings, in some instances it may be desirable to utilize side opening boxes whereby the flowers are inserted and removed from the side rather than the top.

In all instances the water bucket is preferably first filled about $\frac{3}{4}$ full of water and is preferably although not necessarily transparent so that the water level may be readily ascertained. During the conventional first overnight storage at the growing establishment, this water level normally drops so that the water bucket is approximately half full. This is referred to herein as the "first draw" of the relatively dry flowers. Subsequent withdrawal of water by the flowers is usually at a much slower rate, at least partly due to the fact that once the flowers are in transport, they are usually kept under refrigeration, i.e., are in refrigerated trucks or the like so that the rate of water requirement diminishes. Other nutrients, of course, may be added to the water in the buckets, particularly those of the enzyme type, one of which is commonly now referred to as "petal life," which supplies enzyme nutrients to the flowers during transport. An important feature of the present invention is the circular retention of the flowers at the open orifice of the bucket and at the upper ring of the wire basket if the basket is used. Thus, any jostling or bouncing to which the container is subjected does not cause the cut ends such as ends 226 in FIGURE 12 of the flowers to bang or bounce against a rigid member which action might otherwise produce the stem end sealing of the flowers previously described, which action substantially reduces their water drawing capabilities.

In the embodiment of FIGURES 12-15 the sleeve 218 cooperates to prevent spillage from the container, which spillage is also prevented in this and the other embodiments by the bunched action of the stems passing into the open mouth of the water bucket, further assisted by the swelling action of the stems as they draw water from the bucket. The sleeve 218 is preferably separable from the water bucket 216, but if desired may be rigidly attached thereto by any suitable fastening arrangement. The particular materials chosen for each of the elements should be selected in accordance with good shipping practice, i.e., they should have light weight, sufficient rigidity to protect the flowers, and in the case of the water buckets should be resistant to water leakage. Materials such as impregnated or waxed paper, plastics, thin metals, and the like, may be utilized as desired. The water buckets and cooperating wire baskets not only act to protect the flowers during transit, but may be used as individual stands or supports for the bunches of flowers, either prior to or subsequent to shipping. Similarly, the lower section 96

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of the shipping container 80 illustrated in FIGURES 7 and 8 may be used for temporary storage of the flower bunches, and may even be used in the manner of the wire baskets for displaying the flowers at the point of destination.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by United States Letters Patent is:

1. A shipping assembly for transporting cut flowers in a liquid medium without danger of liquid spillage and in such a manner as to protect the flowers from loss of freshness due to dehydration and from physical damage comprising: a container having an opening at the top but being otherwise watertight, said container being partially filled with water during shipment, a plurality of cut flowers received in said container opening, the number of flowers being sufficient relative to the size of said opening so that the stems thereof substantially fill said opening, flower retaining means cooperating with said container and said flower stems to restrain said flowers against excess movement, said flowers being positioned in said opening with the cut ends of said stems spaced from the container bottom, a substantial portion of the water being absorbed into the stems of said flowers to cause radial expansion thereof whereby substantially to seal said opening against leakage of water out of said container, said flower retaining means comprising a basket having a plurality of spaced horizontal rings, and a pair of generally U-shaped vertical braces having spaced arms secured to said rings, said basket receiving said container to immobilize the same therein, said spaced arms extending sufficiently above said container to support at least one of said rings above said container opening whereby said one ring surrounds the stems of said flowers above said container opening in a slightly compressed condition to prevent said movement thereof, said container being provided with an annular flange overlying one of said rings, said container being suspended from said one ring above the bottom of said basket.

2. A shipping assembly for transporting cut flowers in a liquid medium without danger of liquid spillage and in such a manner as to protect the flowers from loss of freshness due to dehydration and from physical damage comprising: a rigid container having side walls and an opening at the top but being otherwise watertight, said

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container being partially filled with water, a plurality of cut flowers positioned in said container opening, the number of flowers being sufficient relative to the size of said opening so that the stems thereof substantially fill said opening, flower retaining means cooperating with said container and said flower stems to restrain said flowers against excess movement, said flowers being positioned in said opening with the cut ends of said stems spaced from the container bottom, a substantial portion of the water being absorbed into the stems of said flowers to cause radial expansion of said stems against one another and against the walls of said container so as to seal said opening against leakage of water out of said container, said flower retaining means comprising a basket having a plurality of spaced horizontal rings, and a pair of generally U-shaped vertical braces having spaced arms secured to said rings, said basket being positioned in said container with the sides of said container lying closely adjacent said braces to substantially immobilize said container within said basket, said spaced arms extending sufficiently above said container to support at least one of said rings above said container opening whereby said one ring surrounds the stems of said flowers above said container opening, said ring maintaining said stems in a slightly compressed condition to prevent their movement.

3. A shipping assembly according to claim 2 wherein the spaced arms of said U-shaped braces are disposed in substantially mutual parallel relationship to each other.

4. A shipping assembly according to claim 2 wherein the base portions of said U-shaped vertical braces intersect one another adjacent the bottom of said basket.

References Cited

UNITED STATES PATENTS

129,444	7/1872	Wilder	47—41
603,649	5/1898	Leedy	47—34.11 X
880,549	3/1908	Lord.	
951,684	3/1910	Gillespie	47—35
1,270,554	6/1918	Rubel.	
1,725,490	8/1929	Talbot	47—41
1,762,843	6/1930	Straub	47—41.11
2,049,645	8/1936	Fleckles	47—41
2,352,766	7/1944	Bogue.	
2,550,355	4/1951	James	47—41 X
2,593,895	4/1952	Kohl	47—34.11 X
3,022,605	2/1962	Reynolds	47—58

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