ABSTRACT: A radiation-sensitive emulsion is applied to an end of each container prior to packing in a shipping carton. After storage and without removing the containers from the carton, X-rays or gamma rays are passed through a shield formed with apertures to expose on the emulsion of each container desired indicia, such as price symbols. Thus canned goods may be warehoused in shipping cartons and then price marked prior to shipment from the warehouse without uncasing the cans and without the necessity of the retail clerk price marking individual cans.
METHOD AND APPARATUS FOR MARKING CASED CONTAINERS BY RADIATION OF SENSITIVE EMULSIONS

METHOD AND APPARATUS FOR MARKING CASED CANS AND BOXES

A typical example of use of the invention is in price marking of canned goods stored in a central warehouse and shipped to the various units of a chain store operation.

Canned goods and similar retail store items are frequently packed in corrugated containers and stored in warehouses for prolonged periods of time before being shipped to individual stores. For example, canned goods are packed seasonally and shipped out for retail display frequently as long as a year subsequent to the packing. Market conditions cause price fluctuations during the storage period which makes price marking of the cans at time of packing in the containers impractical. The present invention is concerned with elimination of the time consumed and the possibility of error when clerks mark prices on the cans after they have been received at the retail store.

In accordance with the present invention an emulsion is applied in a spot to an end of each can or container prior to being encased in the corrugated shipping container. The emulsion is sensitive to radiations of a frequency outside the range of natural daylight or those lights conventionally illuminating shelves of markets. Preferably, the emulsion is sensitive to x-rays or gamma rays which will penetrate through the covering of the corrugated container making it unnecessary to open the cover flaps in order to expose the emulsion to a price indication. In a preferred form of the invention, cased containers of goods pass along a conveyor and are brought to rest under a template having price indications thereon patterned identical to that pattern on the ends of the cans in the container. Above the template is an x-ray or gamma ray machine which causes exposure of the price indications. Such exposure occurs immediately prior to shipment of the merchandise from the warehouse to the retail store and thus occurs a considerable time period subsequent to the initial packing of the containers.

The emulsion is so sensitized that the price indication is visually exposed thereon but exposure to daylight or artificial illumination in a store after the canned goods are stored on the shelves does not cause a rapid fading of the price indication.

Accordingly, a feature and advantage of the present invention is the fact that price indications can be applied to a box containing a plurality of containers, each container being marked with an identical price, the time or of marking being at the option of the operator and usually considerably later than the time of packing the containers.

An advantage of the foregoing arrangement is the fact that the clerks of the retail stores do not have to spend time marking prices on cans ends when they shelf the goods since such marking has already occurred at a central warehouse. Further the possibility of error through improper price marking is eliminated.

A still further advantage of a preferred form of the invention is the fact that the marking of the cans can be accomplished with the flaps of the shipping container closed through the use of x-rays or gamma rays which penetrate through the flaps. This arrangement makes it possible to permanently seal the container flaps at the time of casing the same and does not require that the flaps be opened until the clerk is ready to place the individual cans on the shelf.

An optional feature of the invention is the use of an emulsion in which the price figures will gradually fade with the passage of time and exposure to natural or artificial illuminating lighting. Thus, the length of time the mark has remained on a shelf may be judged by visual inspection of the sharpness of the price marking.

Additional features of the invention are its low cost of operation, the rapidity with which the markings can be applied and the decrease in possibility of error.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is a schematic perspective view of a portion of a conveyor in which the present invention is installed; and

FIG. 2 is an enlarged fragmentary perspective view of a can end showing the price marking.

In accordance with the present invention, a conventional end 11 for a can 12 is provided with a spot of emulsion 13 which is sensitive to certain radiation wave lengths but is not sensitive to ordinary daylight or artificial light of the type used in stores. The shape and size of such emulsion spot 13 is subject to variation, but preferably it is located in about the center of the can and is sufficiently large to accommodate a reasonably legible price marking 14 applied in accordance with the method and apparatus hereinafter set forth.

It will be understood that the spot of emulsion 13 may be of a type which is sensitive to infrared rays or ultraviolet rays but preferably is of a type which is sensitive only to rays such as x-rays or gamma rays which will penetrate through the end flaps of a shipping container of conventional corrugated board construction. On the other hand, the spot 13 may be sensitive to ordinary bright light. The spot may also be of an ink or print sensitive to electricostatic or magnetic forces. All such activity is referred to herein as "radiation." As a further feature of the invention, it is optionally desirable that the price indication 14 fade with the passage of time so that a clerk can judge the time which a particular can has been exposed on a shelf by the sharpness of the price indication.

Cans 12 are conventionally packed in season and after the contents have been heat processed the cans 12 are cased in corrugated board containers 16 of a well-known construction. Commonly there are twelve cans in each layer of the shipping container 16 arranged in three columns of four cans each and there may be two layers per case, in which event the emulsion of the top layer are on top and of the bottom layer on the bottom, as is illustrated particularly in the center of FIG. 1.

As has been stated, usually a considerable period of time elapses between the time that the cans 12 are placed in the shipping containers 16 and during such period price fluctuations may occur, making it undesirable to put the price indications on the can until immediately before the shipping containers are transported from the central warehouse to the individual units of the retail stores. FIG. 1 illustrates the operation of the method and apparatus immediately prior to such shipping. Thus containers 16 are transported along a conveyor 17 and brought to a retractable stop 18 which holds each container 16 stationary for an instant before it is passed along the conveyor to be loaded into a truck. At the station immediately ahead of stop 18 is a template 21 of a material which will not pass radiations of the type used in accordance with the invention. Apertures 22 complementary to the markings 14 to be applied are formed in shield 21 in a pattern corresponding to the pattern of the spots of emulsion 13 on the cans 12. Above the template is a shielded source of radiation 23, for example, an x-ray or gamma ray machine. The radiations from machine 23 pass through the apertures 22 in shield 21 and also pass through the flaps 24 of the shipping container 16 and "expose" the sensitized emulsion 13 causing the indications 14 to be visually apparent. It will be understood, of course, that where x-rays and the like which penetrate flap 24 are not used, the flaps 24 may be opened and the ultraviolet or infrared radiation used to accomplish the same result. Where there are tow layers of cans, a second source 23A is located below the marking station and the cans and template 22A interposed between the source 23A and bottom layer of cans. Sources 23A and template 22A are preferably similar to elements 23 and 22, respectively.

After the emulsions have been exposed, stop 18 is retracted by means of solenoid 26 or other means and marked cases of containers travel along on the conveyor 17. When the containers reach the store, they are stored for only short periods
of time and the end flaps are opened and the cans are placed on the shelves already marked with the retail price. As has been stated, if the emulsion is such that the price markings fade with the passage of time, a visual inspection of the sharpness of the indications will reveal whether the shelf life of the can is excessive.

In the foregoing description, the application of the invention to conventional cans has been described. It will be understood, of course, that the same method and apparatus may be used with other merchandise, such as boxes.

Although the foregoing invention has been described in some detail, by way of illustration and example for purposes of clarity and understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and scope of the appended claims.

We claim:

1. Apparatus for the purpose described comprising a shield which is impervious to radiations of a selected frequency, said shield being formed with a pattern of identical apertures complementary to indicia, a source of radiation of the group of x-rays and gamma rays of said selected frequency positioned to pass radiation through said apertures, a conveyor for shipping cartons positioned on the side of said shield opposite said source, and a stop inhibiting movement of individual cartons along said conveyor at a position in registry with said shield, and which further comprises a plurality of entirely closed cartons totally impervious to light and having no window portions therein, and means for advancing said cartons along said conveyor, each carton containing a plurality of containers in a pattern complementary to the pattern of apertures of said shield, each container having a spot of emulsion on its exterior, sensitive to radiation of said selected frequency and when exposed to said frequency exhibiting visible symbols.

2. Apparatus according to claim 1 which further comprises a second shield and a second source of radiation on the side of said conveyor opposite said first mentioned shield and source.

3. A closed carton totally impervious to light and having no window portions therein, a plurality of containers in said carton arranged in a pattern, a spot of emulsion on the exterior of an end of each said container of a type sensitive to a restricted frequency of radiation consisting of x-rays and gamma rays and when exposed exhibiting visible symbols corresponding to the pattern of exposure, each said container in said closed carton having an identical visible symbol exposed upon each spot of each container each said spot having less area than the area of said end.

4. A method of marking each container of a plurality of containers encased in a shipping carton totally impervious to light and having no window portions therein, comprising applying a spot of emulsion to at least one end of each container, said spot occupying a restricted portion of each said end, said emulsion being sensitive to radiation of a restricted frequency and when exposed to such frequency exhibiting visible symbols corresponding to a predetermined pattern of exposure, encasing a plurality of such containers in a shipping carton in a preselected pattern with said emulsion applied to each container but not exposed to such radiation, said emulsion of each container disposed in an interrupted pattern corresponding to the pattern of containers in said carton, storing said carton with said containers in unexposed condition wherein for a substantial time period, simultaneously exposing each such emulsion while said carton remains closed to radiation of such restricted frequency through a radiation shield having a plurality of identical apertures complementary to the desired indicia to be imposed on the containers, said apertures formed in an aperture pattern complementary to the emulsion pattern of said containers in said carton, said frequency being of the group of x-rays and gamma rays.