

[54] COVER-CLOSURE FOR CONTAINERS WITH A RELATIVELY LARGE OPENING

Primary Examiner—George T. Hall

[75] Inventors: Wilfried Mrusek, Bellheim; Horst Rosewicz, Ludwigshafen, Rhine, both of Germany

[57] ABSTRACT

[73] Assignee: Elbatainer Kunststoff- und Uerpackungs-Gesellschaft mbH. & CO., Ettlingen, Germany

A cover-closure for containers having a relatively large opening, in particular for barrels, cans or the like, produced of synthetic material, which comprises a container having on the outside at its edge an annular rim formed of the container wall and radially projecting locking cams. A cover has an edge disposed downwardly angularly and outwardly surrounding the annular rim in the securing position. The segment is divided at least partly into segments equipped with projections extending outwardly from the lower end section, by means of vertical cutouts. The segments, in case the cover is mounted, is capable of being tensioned against the container edge below the annular rim with a tensioning ring disposed on the outside about the segments and capable of being locked below the locking cams. The container has at least three of the locking cams formed of the annular rim and is along the periphery symmetrically disposed and formed of the annular rim. In the container-wall sections are disposed between the locking cams below the locking cams at least one deepening provided adjusted as to shape to the cover edge segments.

[22] Filed: Jan. 28, 1972

[21] Appl. No.: 221,635

[30] Foreign Application Priority Data

Jan. 29, 1971 Germany..... 2104193

[52] U.S. Cl. 220/60 R, 220/55 AN, 215/41, 215/96

[51] Int. Cl. B65d 43/10

[58] Field of Search 220/55 AN, 60, 59; 215/96, 215/95, 41

[56] References Cited

UNITED STATES PATENTS

3,531,013 9/1970 Hammes 220/55 AN
2,812,093 11/1957 Podesta..... 215/96

2 Claims, 6 Drawing Figures

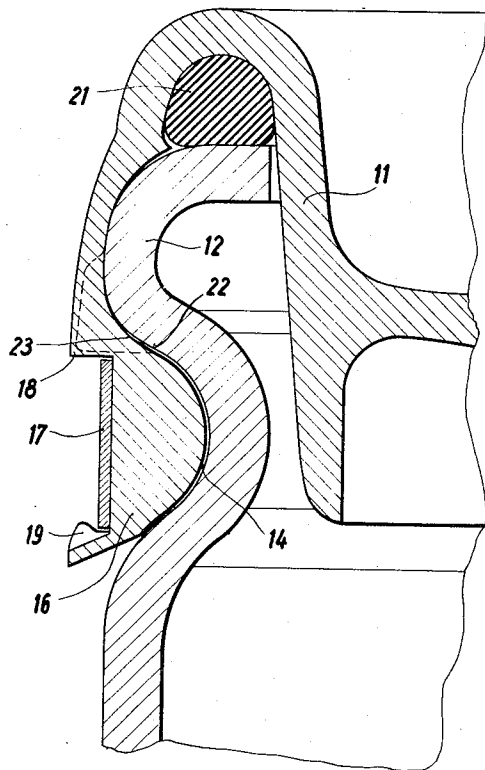


Fig. 1

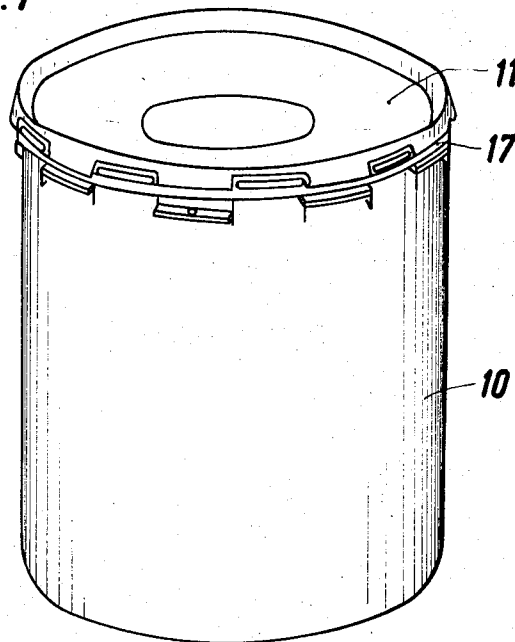


Fig. 2

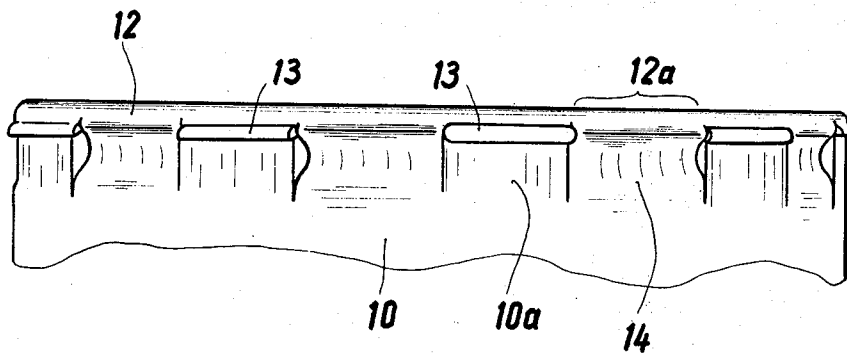


Fig.3

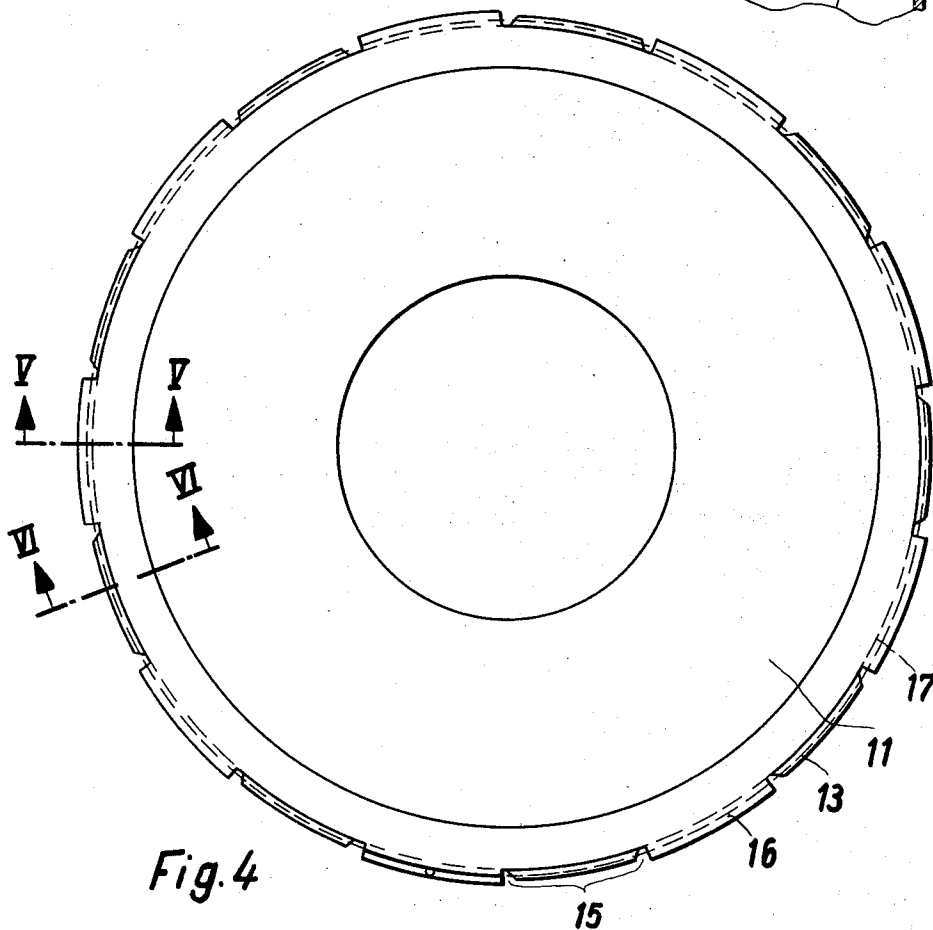
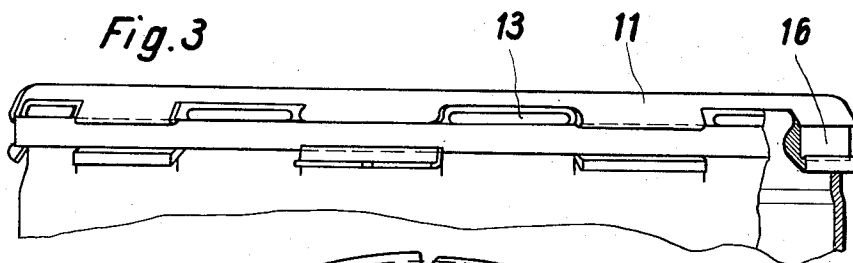


Fig.4

Fig. 5

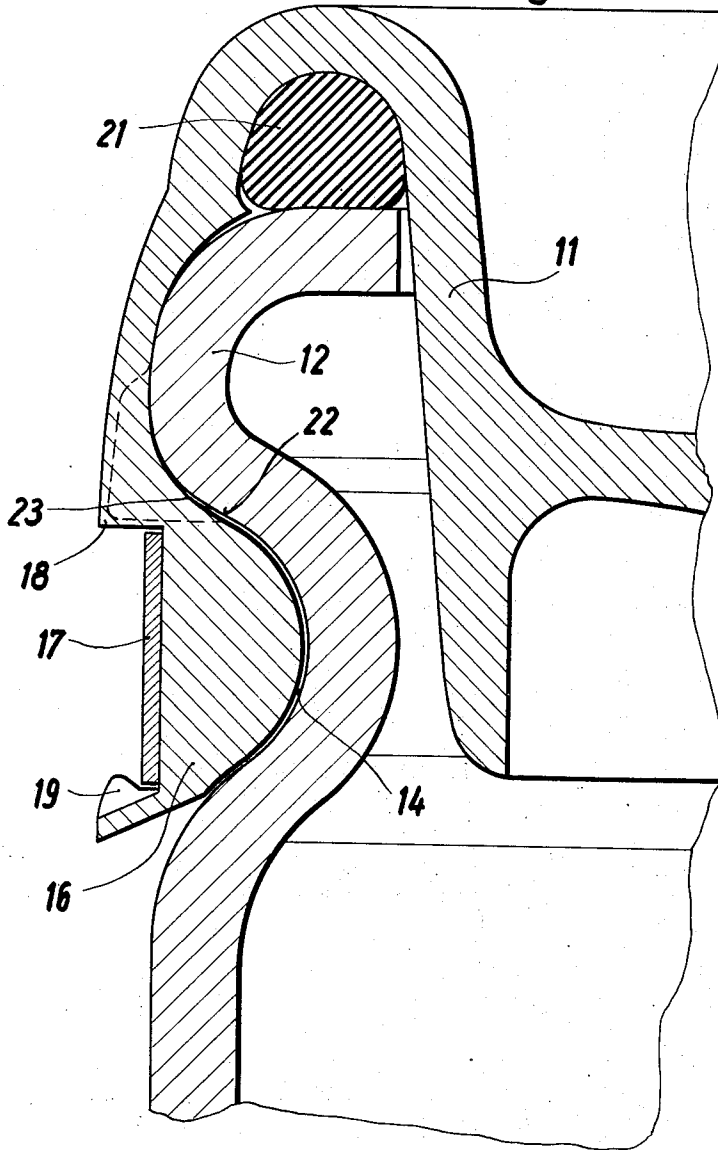
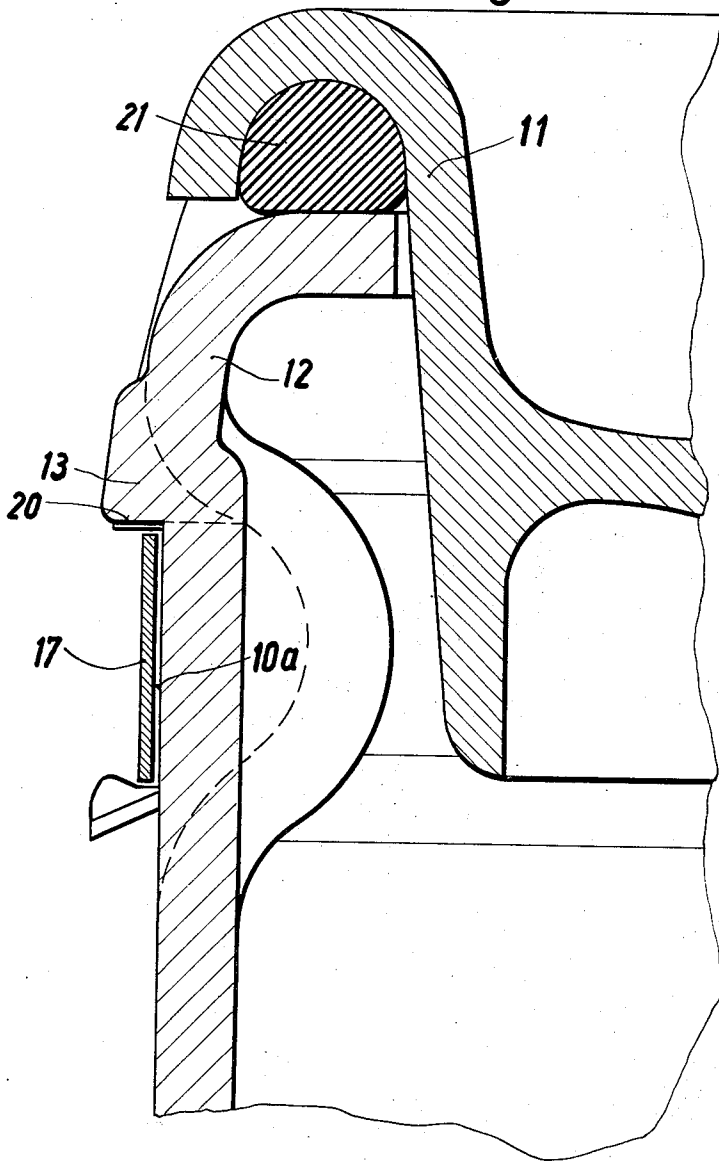


Fig. 6



COVER-CLOSURE FOR CONTAINERS WITH A RELATIVELY LARGE OPENING

The present invention relates to a cover-closure for containers with a relatively large opening, particularly for barrels, canisters or the like produced of synthetic material, whereby the container has an annular rim which is formed out of the container wall as well as radially projecting locking or latching cams, while the cover has an edge, which is angularly disposed downwardly and which, in its secured position, surrounds the annular rim, and which is divided through vertical cut-outs into a plurality of segments equipped with projections extending outwardly, at least partly, from the lower end section, which segments, in case of the mounted cover, are tensionable below the annular rim with a tension ring, disposed on the outside about the segments against the container edge and lockable below the locking cams.

In a device for containers having a large opening, thus so-called wide-mouthed barrels, a considerable falling resistance is required since the stresses occurring during a fall can easily press open the cover-closure and cause resulting damages, due to deformation of the container and the sudden excess pressure in its interior. This applies in particular, where the containers and covers are made of synthetic material.

Cover-closures for containers of the above described type are already known. Thus, for example, known synthetic barrels have an annular rim on the outside of their edge, and the covers have an outer edge which is divided into segments by means of vertical cuts and which outer edge in securing position of the cover surrounds the annular rim on the outside. A tensioning ring is placed on the outside, around the edge of the cover secured in its position by projections, with which tensioning ring the cover edge segments are tensionable below the annular rim against the cover edge. However, these known cover-closures do not offer sufficiently safeguard for a firm seat of the cover, since in case of a deformation of the barrel within the range of the cover-closure, often the cover edge can slip away across the annular rim of the barrel, starting from the deformed place.

It is also known, to provide at the opening edge of barrels on the outside with a prefabricated reinforcement ring, whose upper edge has radially outwardly extending abutment segments for the tensioning ring. The outer edge of the cover has appropriate recesses and at its lower edge also radially outwardly extending segments. After the cover is placed upon the barrel mouth, the segments are positioned at a predetermined distance and set off to each other such, that the tensioning ring can be inserted there between and the cover is fixed by its tensioning. The sides of the segments which face the tensioning ring have diagonally rising, respectively falling faces, in order to pull the cover into a rigid and dense position on the barrel mouth, during the tensioning of the tension ring.

This known cover closure has the drawbacks, that prior to the forming of the barrel, the reinforcement ring must be placed into the production mold and must be well welded with the edge of the barrel, in order to obtain the falling rigidity, which method is cumbersome and time-consuming in its manufacture and requires extensive and expensive manufacturing devices, in order to obtain an economically feasible production

speed. Moreover, the ring parts must be prefabricated as sprayed parts, which causes considerable, additional costs. This known embodiment also has the additional disadvantage, that during the tensioning of the lid, the sealing pull load, as well as the constant transport load, must be absorbed by the sections of the tensioning ring as well as by the locking abutment-segments, so that both these elements cannot be easily produced in the desired, cost-saving manner, out of synthetic material.

It is one object of the present invention, to provide for the afore-described type of containers, a particularly economical, produceable cover-closure, in which all the aforementioned disadvantages are avoided and which, on the one hand, withstands the high falling stresses and, on the other hand, affords a particularly easy handling, thus also an easy closing and opening of the container, as well as an adequate sealing safety.

It is another object of the present invention, to provide a container which comprises at least three locking cams formed out of the annular rim and arranged symmetrically across the circumference, and that, at least one depression whose shape is complementary to the cover-edge segments, is arranged below the annular rim in the container wall sections which are situated between the locking cams.

This makes it possible to avoid all afore described shortcomings of the known cover-closures. With the present invention a cover closure with securing elements interlocking nearly completely and which are obtained in a simple manner by forming into or out of the container and cover wall, and which do not require any technical or apparatus expenditure, beyond the conventional forming of the containers and covers. The cover closure, according to the present invention, meets all requirements for the initially described conditions, with respect to falling and transport reliability, sealing safety, economy and easy handling. By the design and arrangement of the cover edge segments complementary to the form and reaching into the container depressions, as well as of the locking cams horizontally overlapping the surrounding tensioning ring, provide jointly a multiple locking and thereby an optimum locking safety for wide-mouth containers, produced of synthetic material is provided. Due to the design, in accordance with the present invention, of the cover-edge segments and the container depressions fitted thereto provide in case of the mounted cover an uninterruptedly smooth bearing surface stabilizing the periphery of the container mouth, is formed.

An advantageous further development of the present invention for cover-closures with an inserted, elastic gasket is obtained, that the depressions that are formed into the container edge have at least on the side which faces the gasket, a tension face which extends obliquely downwardly from the outer edge and that the cover edge segments have, on their side which faces the container edge, fitted oblique faces, which in case of the mounted cover bear upon the pulling faces of the container depressions.

Thus, the sealing pulling load originating from the cover, during tensioning of the tension ring has been distributed to the relatively large-faced cover edge segments, and the container-neck itself, without stressing the synthetic material of the securing elements, in a manner which would impair the repeated securing of the cover.

With these and other objects in view, which will become apparent in the following detailed description, the present invention, which is shown by example only, will be clearly understood in connection with the accompanying drawings, in which:

FIG. 1 is a perspective view of a container with a mounted cover;

FIG. 2 is a side elevation of the container without cover, shown at a larger scale than in FIG. 1, and broken off below the edge zone;

FIG. 3 is a side elevation of the container with mounted cover, shown at a larger scale than in FIG. 1 and with the container broken off below the edge zone, as well as broken open;

FIG. 4 is a top plan view of the container, according to FIG. 3;

FIG. 5 is a section along lines V — V of FIG. 4, shown at an enlarged scale; and

FIG. 6 is a section along the lines VI — VI of FIG. 4, shown at an enlarged scale.

Referring now to the drawing, and in particular to FIGS. 1 and 2, a container 10 is disclosed which has a large opening which almost corresponds with the diameter of the container and a fitting cover 11. The container 10, as well as the cover 11, are made of synthetic material. As appears in FIG. 2, the container 10 has on the outside, at its edge, an annular rim 12, which is formed out of the container wall and which has a plurality of locking cams 13 projecting in radial direction beyond its outer diameter, which locking cams 13 are formed out of the annular rim and are uniformly distributed across the circumference of the annular rim, with respectively equal spacings. On the upper side facing the container edge, the faces of the locking cams run over, in form of arches into the edge face of the annular rim, while on the lower side, which is turned toward the container bottom, the cams 13 are flattened up at respectively the same height. In the outside container edge sections, which are disposed between the locking cams 13, the container wall has a depression 14 directly below the annular rim. The cover has, in its position illustrated in the drawings, an edge, that is angularly disposed downwardly and which is divided through symmetrically placed cutouts 15, into a plurality of segments 16 of equal length, which are arranged over the entire periphery, at equal spacing. The segments 16 are so fitted to the container edge, that they grip upon mounting the cover the container on the outside around sections 12a of the annular rim 12, which are disposed between the locking cams 13 upon applying of pressure against the container edge, enter into the depressions 14. The outer, vertical faces of the cover-edge segments 16 are then situated on the same level with the adjacent outer faces 10a of the container disposed below the locking cams 13. A band-shaped tensioning ring 17 which is placed outside, around the cover-edge segments 16, holds the segments in this tensioned position and lies thereby itself, with its upper margin immediately below the locking cams 13. The tensioning ring 17 is retained at the cover-edge segments in safe relation, by means of protrusions 18 and 19, which project above and below the tensioning ring 17, from the outside segment faces and surround the locking tensioned ring 17 at its edges.

The cutouts 15 in the cover edge are dimensioned such that in case of mounting the cover 11 upon the container 10, the locking cams 13 protruding from the

annular rim 12 of the container, extend freely, through the cutouts 15. As previously mentioned, the locking cams 13 have at their lower side, thus the side facing the tensioning ring, horizontal locking faces 20, which, in case of tensional cover edge segments 16, protrude sufficiently the tensioning ring 17, in order to secure the cover in its affixed position, on the container 10.

In the cover, an elastic gasket 21 is inserted into an annular groove, which ring 21 bears on the upper margin of the container's neck upon mounting of the cover 11 on the container 10. The depressions 14, which are arranged in the container's edge, below the annular rim 12 which defines the opening rim or edge, have a pulling face 22 which extends obliquely downwardly from the outer edge and is situated on the side facing the gasket, while the cover edge segments 16 are provided on their side which faces the container edge, with fitted diagonal faces 23, which bear upon the pull faces of the container-depressions in case of the cover being mounted, at which time the lid-edge segments are pulled into the depressions, the oblique face 23 of the segments, slide away obliquely downwardly, on the pulling faces 22 of the depressions which causes the cover to be pulled and retained in its fixed and sealing position on the container mouth. At the same time, the gasket 21 which is situated between the cover and the container edge is pressed into a shape which seals the container mouth.

The number of locking cams 13 and of cover-edge segments 16 can be determined as desired, depending upon the size of the container opening. However, at least three locking cams arranged at equal spacing from each other, should be provided which, if the locking parts get deformed, will reliably prevent the sliding out of the locking ring and of the lid-edge segments, from their effective locking position.

While we have disclosed one embodiment of the present invention, it is to be understood, that this embodiment is given by example only and not in a limiting sense.

We claim:

1. A cover-closure for containers having a relatively large opening, in particular for barrels, cans or the like, produced of synthetic material, comprising
 - a container having on the outside at its edge an annular rim formed of the container wall and radially projecting locking cams,
 - a cover having an edge disposed downwardly angularly and outwardly surrounding said annular rim in the securing position,
 - said cover edge being divided at least partly into segments equipped with projections extending outwardly from the lower end section, by means of vertical cutouts,
 - said segments, in case said cover being mounted, being capable of being tensioned against said container edge below said annular rim with a tensioning ring disposed on the outside about said segments and capable of being locked below said locking cams,
 - said container having at least three of said locking cams formed of said annular rim and disposed along the periphery symmetrically at the upper part of vertical outer faces, and in containerwall sections disposed between said locking cams and said vertical outer faces below said locking cams at least one deepening being provided adjusted as to shape to said cover edge segments complementarily.
2. The cover-closure, as set forth in claim 1, wherein said locking cams are flattened on the lower side pointing towards said tensioning ring, in case said cover being mounted, at equal height.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,792,797

Dated February 19, 1974

Inventor(s) Wilfred Mrusek et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet the assignee's names should read

-- Elbatainer Kunststoff-und Verpackungs-Gesellschaft
m.b.H. & Co., Ettlingen, Germany and Badische Anilin-
& Soda-Fabrik A.G., Ludwigshafen, Germany. --.

Signed and sealed this 24th day of September 1974.

(SEAL)

Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents