MICROSCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963
COMMONWEALTH OF AUSTRALIA
Patents Act 1952-69

APPLICATION FOR A PATENT

11 16 4/76

HONEY ZILLA RUMBLE, of 47 Orchard Court, Portman Square, London, W.1, England, 498 556

APPLICATION ACCEPTED AND AMENDMENTS ALLOWED 2/1/79

hereby apply for the grant of a Patent for an invention entitled

"Display unit"

"IMPROVEMENTS IN OR RELATING TO DISPLAY UNITS MORE PARTICULARLY FOR CASSETTES, TAPE CARTRIDGE AND THE LIKE"

which is described in the accompanying complete specification.

This application is true, complete and correct and is based on the product described in the accompanying specification.


101 Mort Street, Balmain,

My/Our address for service is: F. B. Rice & Co., P.O. Box 1400, Sydney, N.S.W.

Dated this 11th day of February, 1976.

by

HONEY ZILLA RUMBLE

Patent Attorney

F. B. RICE & CO.
DECLARATION IN SUPPORT OF AN APPLICATION FOR A PATENT OR PATENT OF ADDITION

1116/76

In support of the Convention Application made by

HONEY ZILLA RUMBLE

for a patent

"Improvements in or relating to Display Units more particularly for Cassettes, Tape Cartridges and the like"

(1) HONEY ZILLA RUMBLE, a Canadian Citizen, of 47 Orchard Court, Portman Square, London W.1, England

Do solemnly and sincerely declare as follows:

1. I am the applicant for the patent.

2. The basic application as defined by Section 141 of the Act was made in GREAT BRITAIN

on the 30th day of August 1974 by

3. We are the actual inventors of the invention referred to in the basic application.

CLIVE ST. JOHN RUMBLE and RICHARD ROY RUMBLE, of 47 Orchard Court, Portman Square, London W.1, England

and PATRICK JOSEPH HENDERSON, of Coastguard Road, Larne, Northern Ireland, all British Subjects are

the actual inventors of the invention and the facts upon which entitled to make the application, are as follow:

I am the assignee of the said CLIVE ST. JOHN RUMBLE, RICHARD ROY RUMBLE and PATRICK JOSEPH HENDERSON

4. The basic application referred to in paragraph 2 of this Declaration was the first application made in a Convention country in respect of the invention the subject of the application.

DECLARED at LONDON

21st day of March 1976

Signed

Honey Rumble

To: THE COMMISSIONER OF PATENTS.
CLAIM 1. A display unit for cassettes and like articles, said unit comprising a plurality of trays mounted on a support member and spaced axially along said support member to provide at least one display section for cassettes between adjacent trays, said trays being rotatably mounted on said support member and the adjacent trays of each said display section being movable axially apart along said support member for releasing a selected cassette, wherein said axial movement of said trays of a display section is obtained by relative rotation of said trays on said support member, the adjacent trays of each display section having cooperating cam surfaces adapted to move said trays axially apart on said support member upon said relative rotation of said trays.
COMPLETE SPECIFICATION

(Application Number : 11164/76)

Class Int. Class

Complete Specification Lodged : 498,556
Accepted :
Published :

Priorit :

Related Art :

Name of Applicant : HONEY ZILLA RUMBLE

Address of Applicant : 47 Orchard Court, Portman Square,
London, W.1, England,

Actual Inventor : Clive St. John Rumble
Richard Roy Rumble
Patrick Joseph Henderson

Address for Service : F.B. RICE & CO.,
Patent Attorneys,
The Forth and Clyde,
101 Mort Street,
BALMAIN. 2041.

Complete Specification for the invention entitled:
"IMPROVEMENTS IN OR RELATING TO DISPLAY UNITS MORE
"DISPLAY UNITS"
PARTICULARLY FOR CASSETTES, TAPE CARTRIDGES AND THE LIKE".

The following statement is a full description of this invention
including the best method of performing it known to us :-
According to the invention there is provided a display unit for cassettes and like articles, said unit comprising a plurality of trays mounted on a support member and spaced axially along said support member to provide at least one display section for cassettes between adjacent trays, said trays being rotatably mounted on said support member and the adjacent trays of each said display section being movable axially apart along said support member for releasing a selected cassette, wherein said axial movement of said trays of a display section is obtained by relative rotation of said trays on said support member, the adjacent trays of each display section having cooperating cam surfaces adapted to move said trays axially apart on said support member upon said relative rotation of said trays.

In a preferred embodiment the display unit is intended for location in a vertical position and the support member comprises a central rod or support pillar for mounting on a base member or other structure. The trays are normally spaced apart a distance for accommodating the cassettes to be displayed and each tray is formed with a retaining flange or other means for preventing the removal of cassettes therefrom.
This invention relates to units for displaying cassettes, tape cartridges, books, watches, pens, records and the like (hereinafter referred to generally as cassettes) for inspection, for example, by customers in premises such as shops.

Hitherto, cassettes for sale have generally been openly displayed for examination by potential customers on counters or open display units. The present invention has as its main object the provision for an improved display unit, the construction of which enables cassettes to be stored for ready inspection as to their content but which prevents the unauthorised removal of the cassettes from the unit by the customer. A further object is to provide such a display unit which is simple in construction and which provides also a considerable saving in space due to its improved design and method of mounting.

In its broadest aspect the display unit, in accordance with the invention, is primarily intended for location in a vertical position. The unit comprises a central rod or support pillar for mounting on a base member or other structure and which carries a plurality of shelf-like units or trays for supporting the cassettes to be displayed. The trays are normally spaced apart a distance for accommodating the cassettes to be displayed and each tray is formed with a retaining flange or other means for preventing the removal of cassettes therefrom. In a preferred
embodiment of the invention adjacent trays are formed with co-operating cam members whereby relative rotation of the adjacent trays provides an axial movement of at least one of the trays along the rod or support pillar so as to provide a larger gap between the adjacent trays thus permitting the removal of a selected cassette.

In order that the invention may be clearly understood the preferred embodiment will now be described in detail with reference to the accompanying drawings in which:

Figure 1 is a side elevation of the display unit in accordance with the invention with the trays in the locked position;

Figure 2 is a part sectional view on an enlarged scale of the trays adjacent the locking mechanism of the display unit;

Figure 3 is a top plan view of one of the trays of the display unit;

Figure 4 is an underneath plan view of the tray of Figure 3;

Figure 5 is a development view from inside the hub sections of two adjacent trays showing the
interengagement of the cam surfaces on the hub sections with the corresponding cam surfaces on the spacer section mounted on the adjacent lower tray;

Figure 6 is a view similar to Figure 5 but showing the adjacent trays moved to a spaced position to allow removal of a selected cassette carried by the lower tray; and

Figures 7A to 7C show diagrammatically the sequence of operations to unlock the display unit to allow the removal of a cassette from a particular tray.

Referring now to Figures 1 and 2 of the drawings, the display unit 10 comprises a central spindle 11 fixedly mounted on a stand 12 having supporting feet 13. A plurality of shelf-like units or trays 14 are rotatably-mounted on the fixed spindle 11 for displaying cassettes 15 for inspection by potential customers.

Each tray 14 is circular in construction with a central hub section 16 having an upper part 16a extending above the tray and a lower part 16b extending below the tray. A spacer section 17 is detachably connected to the upper part 16a of the hub sections of those trays on which cassettes are to be displayed. The sections 17 are mounted on the central spindle for rotation with the tray to which they are attached and
their axial length is determined by the size of

the articles to be displayed. In Figure 3 the spacer
section 17 is shown in the top plan view of the tray
so as to indicate cam surfaces 18 on the upper edge
and which co-operates with similar cam surfaces 19
on the lower edge of the hub section 16b of the next
uppermost tray (see Figure 4). The shape of these cam
surfaces and their function will be described herein-

after with reference to Figures 5 to 7 of the drawings.

In the assembly of the unit a spring clip (not
shown) is fixedly mounted on the lower end of the
spindle 11 adjacent to stand 12. A washer is located
to engage over the spring clip and this supports the
first tray 14 in lower part 16b of its hub section.

Trays 14 (with spacer sections 17) are then fitted on
the central spindle 11 to provide the appropriate
number of display sections 20. The unit is completed
by a locking section 21, a further display section 20
and finally by an advertising section 22.

The locking section 21 is shown in greater
detail in Figure 2. In this section of the unit the
upper part 16a of the hub section of the lower tray 14
is provided with a short spacer section 23 which is
fitted within the hub part 16a for rotation therewith.

The spacer section 23 is provided with cam surface 18
which co-operates, as before, with cam surface 19 on
the lower edge of hub part 16b of the upper tray 14.

An outer sleeve 24 is fixedly mounted around hub part 16b and fits over hub part 16a. The sleeve 24 carries a barrel-type key-operated lock 25 having an internally projecting spigot 26 engaged by pressing plunger 27 inwardly within an aperture 28 in the wall of spacer section 23. In order to engage spigot 26 in aperture 28 the hub section 16a must be angularly positioned correctly relative to sleeve 24 and this is obtained by relative rotation of the trays 14 forming the locking section 21. The arrangement is such that during the rotational movement of the trays, the cam surfaces 18 and 19 move relatively to each other and effect an axial movement of the trays. In the locked position as shown, the trays 14 forming the locking section 20 are spaced apart the maximum distance. Release of the locking mechanism enables the parts to rotate relatively to each other as shown by the arrows in Figure 1, which by reason of the cam surfaces permit the trays to move axially towards each other thus providing an unlocked condition in which the trays are spaced a minimum distance apart.

The advertising section 22 consists of a lower tray 14 the upper hub section 16a of which is fitted with an end cap 30 which in the locked position of the locking section 20 engages a washer 31 on spindle 11 which is fixedly retained by a spring clip. The hub part 16a of the upper tray 14 of the advertising section 22 is similarly fitted with an end cap 32 which engages
washer 33 in the locked position of the unit, the washer 33 being retained by a spring clip and the spindle 11 being completed by a cover 34. An advertising ring 35 is located between the trays 14 of the advertising section 22. The fixed end washers 11A and 33 provided a datum operating length on spindle 11.

In the unlocked condition of the unit the reduction in the axial distance between the trays 14 of the locking section 21 provides a similar axial distance along the length of the spindle 11 between the fixed end washers for relative axial movement between the trays 14 of a selected display section 20. It is only necessary to rotate the trays of the selected display section 20 in opposite directions to obtain an axial movement of the upper tray upwardly away from the lower tray due to the co-operating cam surfaces 18 and 19. This increased spacing of the trays permits the removal of a selected cassette.

The cassettes 15 are supported on the upper surface of the trays 14 of each display section 20. Referring to Figure 3, each tray 14 has an inner ring section 36 surrounding the hub 16 and which is connected with an outer ring 37 by a plurality of flat spokes 38 which may be radially located, but which are preferably aligned as shown, away from the radial direction. The spokes 38 are arranged in parallel pairs and the spokes of each pair have upstanding flanges 39 along their outer edges so as to provide cassette receiving channels. The outer ring 37 is provided with a peripheral rim 40.
which extends upwardly to block the outer end of each of the channels and also downwardly to block the outward movement of cassettes from the corresponding channels in the next lowermost display section 20. To ensure such blocking action the rim 40 is provided also with spaced downwardly extending lugs 41 above each channel. As shown in Figure 4 the underneath of the ring section 37 is also provided with downwardly extending lugs 42 projecting inwardly from the rim 40 parallel to the outer edge of the longer spoke of each pair. The lugs 42 support one side edge of the corresponding cassette which can move in the opposite direction with the lower tray as the trays are contra-rotated. The cassettes 15 are supported along their inner edges by angled arms 43 extending from the spacer member 17.

Figures 5 and 6 of the drawings are inside views of the hub sections 16 of a pair of trays 14 forming a display section 20 together with the intermediate and adjacent spacer sections 17. The upper spacer section 17 engages within the upper section 16a of the hub section 16 and has a slot 44 which is engaged by an axial projection 45 on the inside surface of hub section 16a to prevent relative rotation of the parts. The upper edge 46 of the hub section 16a engages a shoulder 47 on the outer surface of spacer section 17 and the lower edge of spacer section 17 is shown at 48.

The hub section 16 has an inside ring 49.
The lower hub section 16b has its lower edge 50 engaging a shoulder 51 on the outer surface of the next lower spacer section 17 which has an inside ring 52 provided with an aperture for spindle 11. The inside surface of the hub section 16b is formed with cam surface 19 which comprises an inclined stop section 53 followed by a straight dwell section 54, a short inclined stop section 55, a straight dwell section 56, an inclined section 57 and a stop section 58. The co-operating cam surface 18 on the upper edge of spacer section 17 corresponds to cam surface 19 and comprises an inclined section 59 abutting inclined stop section 53 in the closed position of the display section 20 as shown in Figure 5, followed by surface 60 engaging surface 54, inclined surface 61 engaging stop surface 55, surface 62 engaging surface 56 and surface 63 engaging surface 57. Figure 6 shows the relative position of the cam surfaces as the top hub 16 is moved angularly relative to the spacer member 17 of the lower hub 16. As the parts rotate, surface 61 rides over and out of the inclined stop surface 55. This causes the hubs to move axially apart and the movement continues as surface 63 slides down surface 57 and until surface 61 engages stop surface 58, in which position surface 62 engages below surface 58A to hold the parts axially spaced. The axial distance between the hub sections of the trays in each position is shown by the arrows. In the reverse
direction of movement surface 63 slides up surface 57 until surface 60 engages with surface 54 and the surface 59 abuts stop surface 53. As shown the hub section 16b is provided with a retaining overlap or guard 64 over surfaces 54, 55 and 56 and a further overlap or guard 65 over stop surface 58 (see also Figure 4). The guards 64 and 65 retain surface 60 of cam 18 in position to prevent jumping out of surface 60 due to forced rotation of the parts especially in the locked position.

Figures 7A to 7C are diagrammatic views of a display unit showing the sequence of operations to release a selected cassette.

In Figure 7A the locking mechanism 25 is engaged in the locking section 21 to maintain the trays 14b and 14c spaced apart their maximum distance so that the stack of trays occupies the effective length of spindle 11 between the fixed washers thus preventing any relative axial displacement of the trays to release cassettes. It will be noted that the cam surfaces 18 and 19 in locking section 21 are in position of Figure 6.

In Figure 7B the locking mechanism has been released thus allowing tray 14b to rotate relatively to tray 14c until the cam surfaces are in the position of Figure 5. In this position the tray 14b has been moved downwardly together with the tray 14a.

Figure 7C shows the removal of a selected cassette 15 from display section 20b by rotation of
tray 14c relatively to tray 14d. The relative movement of the co-operating cam surfaces produces a relative axial movement resulting in a movement of tray 14c upwardly on the spindle 11 together with the trays 14b and 14a. In this condition the cassettes on tray 14d are now positioned between adjacent lugs 41 on tray 14c so that the selected cassette can be removed.

The locking section 21 can of course be located at any position along the display unit while the advertising section can be omitted.

If desired the trays 14 need not be provided with the lower extension of the rim 40 as the design of the lugs 41 will provide the blocking action necessary. Alternatively, the rim may extend downwardly an amount similar to that of the lugs 41 and slots may be provided at the appropriate release points for the cassettes.

The display unit of the invention provides for easy and simple operation of the parts to space a desired display section. Little effort is required to lift the trays axially even from the bottom display section so that units of considerable size can be provided. The cam surfaces are designed to hold the trays of a selected display section apart thus allowing the operator to release the parts before removing the cassette.
THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS :-

1. A display unit for cassettes and like articles, said unit comprising a plurality of trays mounted on a support member and spaced axially along said support member to provide at least one display section for cassettes between adjacent trays, said trays being rotatably mounted on said support member and the adjacent trays of each said display section being movable axially apart along said support member for releasing a selected cassette, wherein said axial movement of said trays of a display section is obtained by relative rotation of said trays on said support member, the adjacent trays of each display section having cooperating cam surfaces adapted to move said trays axially apart on said support member upon said relative rotation of said trays.

2. A display unit as claimed in claim 1, wherein each tray of each display section has a hub section mounted on said support member, the cam surfaces being formed on the end surfaces of said hub surfaces.
The claims defining the invention are as follows:

1. A display unit for cassettes and like articles, said unit comprising a plurality of trays mounted on a support member and spaced axially along said support member to provide at least one display section for cassettes between adjacent trays, wherein said trays are rotatably mounted on said support member and the adjacent trays of the or each said display section are movable axially apart along said support member for releasing a selected cassette by relative rotation of said trays on said support member.

2. A display unit as claimed in Claim 1, wherein the adjacent trays of the or each said display section have co-operating cam surfaces adapted to move said trays axially apart on said support member upon relative rotation of said trays.

3. A display unit as claimed in Claim 2, wherein the trays of the or each display section each have a hub section mounted on said support member, the cam surfaces being formed on the end surfaces of said hub surfaces.

4. A display unit as claimed in Claim 2, wherein the hub sections of adjacent trays of the or each display section are interconnected by a spaced section rotatably mounted on said support member, said spacer section being fixedly mounted on the hub section on one of the said tray at one end thereof and being formed at the other end thereof with a said cam surface co-operating with a corresponding said cam surface on the abutting end portion of the hub section of the next adjacent tray.

5. A display unit as claimed in any one of the preceding claims, in which a pair of adjacent said trays form a locking
section having locking means for maintaining the trays of said locking section of said support member spaced apart a predetermined axial distance along said support member.

5. A display unit as claimed in claim 4, wherein said support member is provided with end fixing means providing an effective length thereon for axial movement of said trays and wherein said locking means holds the trays of the locking section spaced apart to prevent axial movement of the trays of the display sections on said support member.

6. A display unit as claimed in claim 5, wherein said locking means is releasable to allow relative rotation of the trays forming said locking section, said trays being formed with co-operating cam surfaces so that said relative rotation reduces the axial distance between said adjacent trays thus permitting axial movement between the trays of a selected display section along said support member to release a desired cassette.

7. A display unit as claimed in claim 6, wherein the locking means is carried by a sleeve mounted on one of said trays forming said locking section around said hub section and includes a spigot adapted to engage an aperture in the hub section of the other tray forming said locking section in a predetermined position of said last-mentioned trays.

8. A display unit as claimed in any one of the preceding claims, wherein the trays are each formed with channels extending from the or a central hub section, said trays being formed with an outer rim member to
prevent removal of said cassette until adjacent trays are moved axially apart along said support member.

9. A display unit for cassettes and like articles substantially as hereinbefore described and as shown in the accompanying drawings.

DATED this 21st day of August, 1978.

HONEY ZILLA RUMBLE
Patent Attorneys for the Applicant:
F.B. RICE & CO.