

Aug. 7, 1951

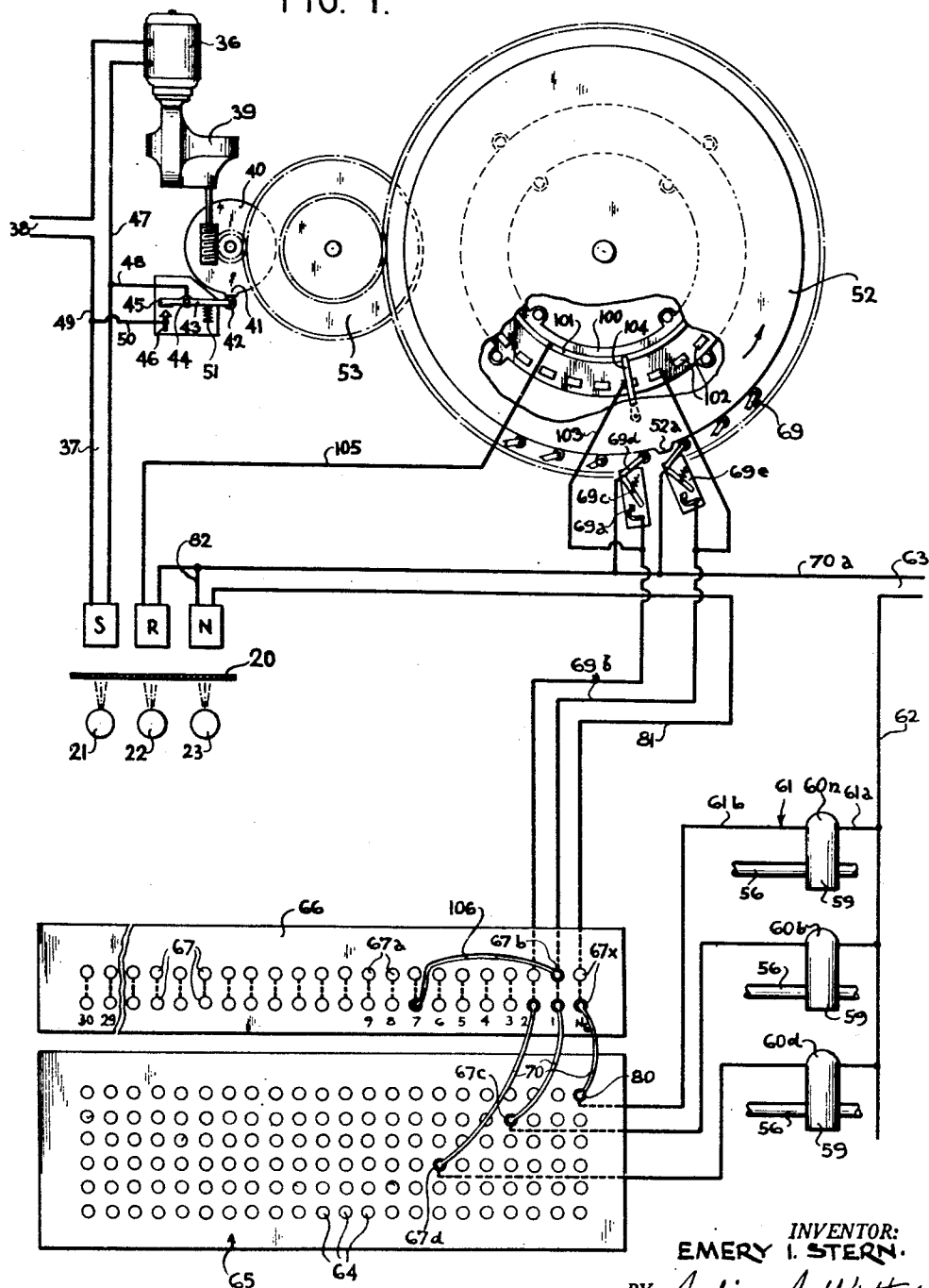
E. I. STERN
ELECTROMECHANICAL SCENT DISTRIBUTION
TO ACCOMPANY A MOTION-PICTURE

2,562,959

Filed Oct. 13, 1947

3 Sheets-Sheet 1

FIG. 1.



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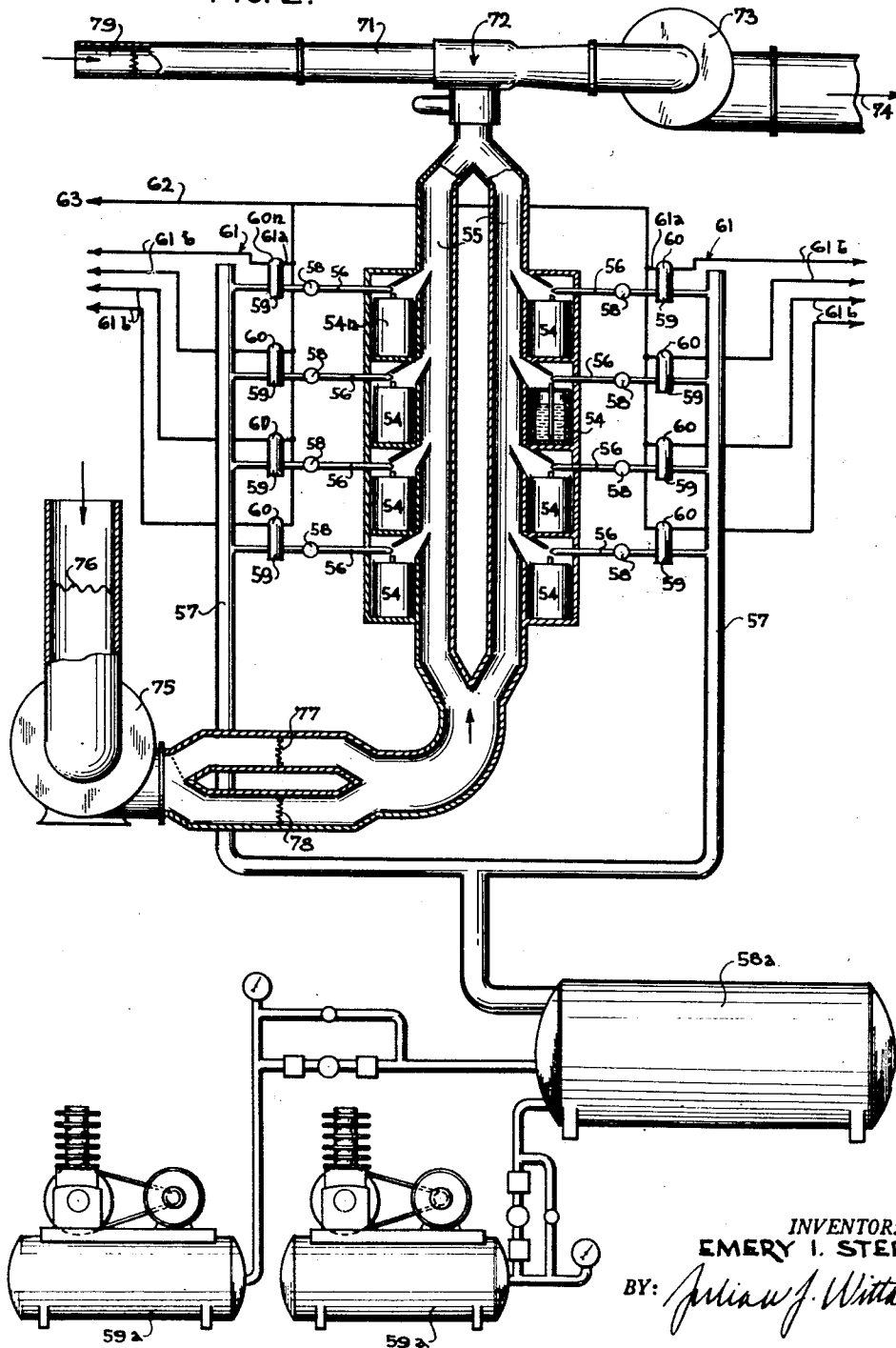
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3 Sheets-Sheet 2

FIG. 2.



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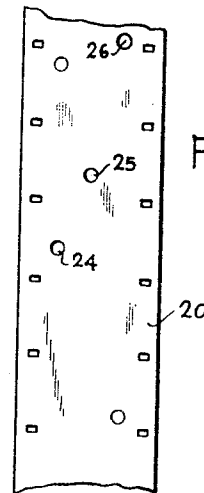
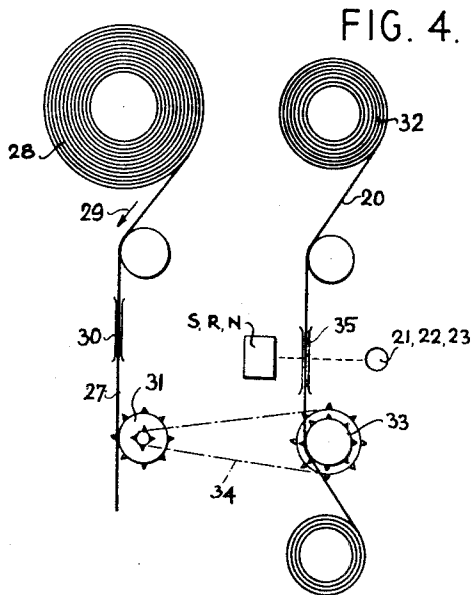
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UNITED STATES PATENT OFFICE

2,562,959

ELECTROMECHANICAL SCENT DISTRIBUTION TO ACCOMPANY A MOTION PICTURE

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4 Claims. (Cl. 88-16)

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This invention relates to release and distribution of scents to accompany a motion picture, and it is an improvement on my co-pending application for Releasing and Synchronizing Methods and Means for Scents, Serial No. 561,751, filed November 3, 1944 now abandoned.

The main object of my invention is to provide a device whereby such action may be performed by electromechanical means in a different manner than disclosed in my said co-pending application.

My present invention also aims to provide means whereby a great variety of scents, and great variety of sequences, may be combined to accompany the showing of a motion picture, through a comparatively simple, easily operated, and still reliable means.

Other objects of this invention will appear as the specification of the same proceeds or will be pointed out therein.

In the drawings, forming a part of this specification and accompanying the same:

Fig. 1 is a diagram showing a preferred form of an electro mechanical scent selector device, according to this invention;

Fig. 2 is a semi-diagrammatic, partly sectional view of one of the scent distribution systems to be used with it;

Fig. 3 shows a portion of a travelling film in which perforations are provided for controlling the scent selection, and

Fig. 4 is a diagrammatic illustration of the device for using said film in the scent selector.

Referring now to the drawings more in detail, by characters of reference, in Fig. 1 the numeral 20 indicates a scent selector film, the same film also being indicated in Fig. 3, and, as will be explained hereinafter, said film operates in synchronism with a motion picture film, the showing of which is to be accompanied by release of appropriate scents.

Light sources 21, 22 and 23 throw their beams on the scent selector film 20 but normally can not penetrate the same, said film being entirely opaque, in the present embodiment of my invention.

Three rows of holes, generally indicated by the numerals 24, 25 and 26, however, are provided in the scent selecting film 20, said holes being opposite to, and in line with, the respective light sources 21, 22 and 23, and it will be seen that any time a hole in a respective row will register with the respective light source, the light beam of the same may pass through said hole.

Three photo-electric relay switches, designated by the letters S, R, N, are arranged in registering

relation with the respective light sources 21, 22 and 23, and, as will be explained presently, the first one, designated by the letter S, will serve to select a scent when a hole in row 24, for scents, in the film 20, passes opposite to the light source 21, and, similarly, the photo-electric cell R will operate to repeat said scent when it is desired, while the last photo-electric cell N, will operate to release a neutralizing agent, following the scent previously distributed, when such an action is desired.

In Fig. 4 is shown, in a diagrammatic manner, the synchronized cooperation of a motion picture film 27 and the mentioned scent selecting film 20.

The numeral 28 indicates the feeding reel of the motion picture film, said film being unrolled in the direction of arrow 29, in a usual projector device (not shown), passing through the film gate 30, and operating, by its usual perforations, a sprocket disk 31.

The scent selecting film is unwound from a reel 32, by the sprocket 33, which is driven from the sprocket 31 by a reduction device 34, so that preferably the speed of the scent selecting film 20 will be much slower than that of the motion picture film 27, but the two, obviously, will be entirely in synchronism.

Film 20, also, will pass through a guide device 35, and the three photo-electric cells S, R, N, preferably are arranged at one side of said device, while at the other side of said guide device are arranged the three light sources 21, 22 and 23. The respective photo-electric cells and light sources are registering with one another, and registering openings are provided in the two sides of guide 35 to permit the light beam to pass there-through and strike the respective photo-electric cell when a hole of its row will move between them.

Returning now to Fig. 1, when a hole 24 passes between the light source 21 and the photo-electric cell S, the light will operate on the device S, which acts as a relay switch for the circuit of the motor 36, said circuit generally being indicated by the numeral 37 and having any appropriate source of power, as at 38.

Upon an activation of the photo-electric cell or relay switch S, motor 36 will start, and, through a reducing gear 39, it will turn the cam disk 40, of course at a greatly reduced speed compared to the speed of the motor. Said cam disk may have one single cam extension or lobe 41, and the arrangement of the device is such that, normally, said lobe will press at the inner end 42 of a lever 43, pivoted at 44, whereby the

outer end 45 of said lever will be separated from an electrical contact 46. Said end 45 is electrically connected, of course in an insulated manner, to one branch 47 of the motor circuit, as indicated at 48, while the electrical contact 46 is connected to the other branch 49 of the said circuit, as indicated at 50.

As soon as the motor 36 starts operating and rotates cam disk 40, the lobe 41 will leave the lever 43, and the spring 51 will close the contacts 45 and 46, closing the motor circuit and keeping the same closed. The motor will run for a full rotation of the cam disk 40, that is, as long as the lobe 41 will again arrive to the lever end 42, will press the same downwardly, against the spring 51, and will break the contacts 45 and 46. In this manner, it will be seen, the motor will be kept running for one rotation of the disk 40, even while the relay switch S may have closed its circuit only for a very short period of time while the respective hole 24 was passing in front of light source 21.

In the present scent selecting system another, much larger and slower moving, cam disk 52a is provided, which is driven at such greatly reduced speed by a reducing gear device, generally indicated by the numeral 53, as will be understood.

The purpose of this second, large and slow moving, cam disk 52 is to release a scent by a prearranged plan, as controlled through the holes in row 24 in the film or tape 20.

When arranging said plan, first the motion picture film 27 will be run off, keenly observed, and measured by any appropriate means, will known to those versed in this art, and various scenes and their times noted, where the distribution of certain scents in the audience will be desirable in order to enhance the impression and effect of those scenes.

After establishing the sequence and times of the scents, the respective holes 24 will be provided in the scent selecting film 20, by any appropriate means.

The scents in the present embodiment of the invention are arranged in appropriate containers 54 (Fig. 2) in liquid form, and will be vaporized and carried into pipes or ducts 55 when an air stream will be blown over them through vaporizing pipes 56, as it is well known in this art. Said vaporizing pipes are connected into compressed air pipe lines 57, which will have a substantially constant high pressure therein, being connected to the compressed air tank 58a. Tank 58a preferably is fed by several compressors 59a, so that the pressure in the whole compressed air system will be kept at a desired high level and as constant as possible.

Reducing and regulating valves 58 are provided in each vaporizing air pipe 56, and each pipe normally is closed by a valve 59, which, however, is connected to and operated by a solenoid 60. The solenoids are inserted into respective electric circuits 61 (Figs. 1 and 2), one branch 61a thereof being attached to the conductor line 62, which will lead to an appropriate source of power 63 for said solenoids, which may be the same as the source of power 38 for the motor 36, or may be another suitable source of electrical power. The other branch 61b of the solenoids 60 will be connected with respective contact sockets 64 in a switchboard 65.

A second switchboard 66 is also provided, having pairs 67 of contact plugs, each pair being electrically interconnected.

A plurality of electric switches, generally indicated by the numeral 69, are equidistantly arranged around the circumference of the cam disk 52 (Fig. 1). One contact 69a of said switches is connected to one of the respective upper contact sockets 67a in the upper switchboard 66, as by wires 69b, while the other contact 69c of the mentioned switches is connected into the return branch 70a of the power circuit 63 for the solenoids 60.

In the embodiment shown, there are thirty switches 69 around the cam disk 52, and there are thirty pairs of upper contact sockets 67 in the switchboard 66.

In the embodiment shown, there also is one more pair of contact sockets 67z, the purpose of which will be explained hereinafter.

Each switch 69 and the corresponding contact socket 67a is adapted to operate one scent, whereby this embodiment of the device is constructed for thirty scents, but, of course, devices may be constructed, on the principle herein disclosed, for less or more scents, as desired.

It is also to be observed that in Fig. 2 I show only eight scents, for the sake of clearness of showing, while, of course, the compressed air and other pipes or conduits there shown may be extended to accommodate thirty scent units 54, to correspond to Fig. 1, as will be obvious.

It also will be observed that the contact points 69a in the thirty switches 69, normally are open, but, upon the operation of the photo-electric cell S, as described, and then the motor 36, gearing 53 and the large cam disk 52, the said disk will be moved, and its single short projection or cam lobe 52a will pass over the next adjacent switch 69a, closing the same for a short interval of time. The proportion of revolutions between the smaller cam disk 40 and the large cam disk 52, in this embodiment, will be arranged in such a manner, that the large cam disk 52 will rotate thirty times slower, that is, one full revolution of the cam disk 40 will correspond to $1/30$ of a revolution of the large cam disk 52, so that it will be understood that cam projection 52a, for one revolution of the cam disk 40, will operate only one adjacent switch 69. Upon cam disk 40 completing one revolution, its projection or cam lobe 51 will again arrive to the lever 43 and will break the contact points 45 and 46, thereby stopping the movement of the motor 36 and the cam disk 52, after the same operated on one single switch 69, let us say 69d.

For the short period of time said switch was operated on (and then the next switch 69e, as shown in Fig. 1) it will be closed and thereby closes a solenoid circuit through the use of a respective contact socket 67a in switchboard 66, as will be shown presently.

In the lower switchboard 65, the contact sockets 64 correspond to the various scents, and they are connected to the respective solenoids, as has been explained hereinbefore.

After the scent sequence for a certain film to be shown has been established, and the scent control film 20 produced according to such sequence, the upper contacts 67 will be connected by respective wires 70 into corresponding sockets 64. So, for instance, the first pair of contact sockets 67, designated by the numeral 67b, and connected to said next switch 69e, has a lower socket, which, for indicating the sequence and number of such pairs in this embodiment, is designated by the numeral 1, and, in the scent sequence now to be used, is connected to the socket

67c, in the lower switchboard, by the jumper wire 70, and thereby completes the circuit of a certain solenoid 60b which operates a predetermined scent, as will be obvious.

On the other hand, the last switch 69d in the arrangement shown in Fig. 1, which is permanently connected to the socket 2 in the upper switchboard 66, will in this arrangement be plugged into the socket 67d in the lower switchboard 65, whereby said switch will close a circuit for the solenoid 60d, controlling another scent.

In the manner now indicated, first the switches 69 to be used will be plugged into appropriate sockets 64 in the lower switchboard 65 to operate the required scents at the necessary moments, as will be obvious, and it will be seen that as the control film 20 travels, it will operate the photo-electric cells S for the respective scents at the respective moments, and there-through the switches 69, whereby the respective solenoid circuits 61 will be closed, and the respective scents 54 released for a short period of time.

When a solenoid 60 opens its valve 59, the compressed air from conduits or pipes 57 will blow over the scent containers 54 and will vaporize and carry a predetermined amount of scent in a predetermined concentration in the conduits 55, and therethrough into the main scent pipe or duct 71. Said main or duct 71 may have a mixing device 72 inserted therein as well as an air suction device or fan 73, after which its contents proceeds into the auditorium, as indicated by the arrow 74. The final distribution of the scent in the auditorium may be performed in any appropriate manner, one of which has been described in my said co-pending application, Ser. No. 561,751.

As also has been explained in my said co-pending application, the air-scent mixture is to be diluted to a desired predetermined degree, as well as the speed of its emanation, and its temperature, are to be regulated so as to make it substantially imperceptible to the audience as by a change in the current of air, or in the temperature, its entry into the auditorium to be noticed only by the scent carried with it.

For this purpose additional air may be added into the conduits 55, the same being provided by an air pump device 75, and electrical heating devices 76, 77 and 78 may be inserted at appropriate places into said additional air currents. Further additional air may be allowed to enter into the system by the suction operation of the fan 73 in the main conduit 71, as indicated at 79.

One purpose of fan 73, however, is to create suction at the vaporizing devices 54, 56, and prevent jamming there.

Obviously, all these air mixtures, pressures, speeds, etc., will be controlled by appropriate devices, well known in this art.

In some cases it is desired to have a certain scent kept released for a longer period than allowed by the short operation of the cam projection 52a, and in such cases, I provide means whereby the last released scent may be repeated and again released.

For this purpose I provide a stationary ring of insulating material 100, underneath and independent of the rotating cam disk 52, on which is a continuous contact ring 101, and thirty individual contacts 102 corresponding to the thirty

switches 69, and each being connected to one respective switch, as indicated at 103.

A contact 104 is carried by the cam disk 52 and it always will be bridging the individual contact 102 corresponding to the last activated switch 69 and the permanent contact ring 101. Contact ring 101 is connected to the photo-electric relay switch R, as at 105, said switch R being activated by the film 20 only in case the last distributed scent is to be repeated, and it will be seen that in such a case the circuit of the last activated solenoid will again be closed through the contact ring 101, and the individual contacts 102, and, obviously, the last released scent will be repeated.

In case any other scent is desired to be repeated than the last one, the same may simply be done by certain jumper wire plugging on switchboard 66.

If for instance, in an example indicated in Fig. 1, when the cam lobe 52a arrives to the seventh switch 69, the same scent is to be released as was done through the first switch 69e, then the respective upper socket 67b for said first switch will be plugged into the lower socket 7 corresponding to the seventh switch 69, and this plugging is done by the jumper wire 106.

Obviously, when the cam lobe 52a arrives to the seventh switch, it will close the same circuit, including sockets 67b and 67c, as was the case for said first scent, and said scent will be repeated.

As has been mentioned in my said co-pending application, it may be desired to release a neutralizing agent after a scent, and for this operation appropriate holes 26 will be provided in the scent control film 20. When such a hole arrives to the photo-electric relay switch N, it will activate the same and thereby release directly a neutralizing agent, which is indicated at 54n controlled by the solenoid 60n.

A socket 80 corresponds in the lower switch 65 to the solenoid 60n and is connected into the upper sockets Nb and 67x and therethrough to the photo-electric relay switch N, as by the conductor 81. The other branch 82 of the circuit of the photo-electric relay switch N is connected into the return line 70a of the power circuit 63. It will be seen that upon the activation of the photo-electric relay switch N, the neutralizing agent will be released for a moment from the container 54n.

With reference to the release of the scents into an auditorium, instead of providing tubes, pipes and ducts to carry them from a central place, obviously a number of scent containers may be arranged at strategic places and the scents released simultaneously, as desired, as by means described hereinbefore.

What I claim as new and want to protect by Letters Patent of the United States, is:

1. In a device to release scents to accompany the showing of a motion picture, a motion picture film driving member, a control film having photo-electrically responsive markings thereon, a second driving member for said control film, means for actuating both said driving members in synchronism, a plurality of scent-laden mediums normally confined, releasing means for each of said scent-laden mediums, a switchboard panel having a plurality of selector contact means corresponding in number to said releasing means, and control means for said panel all electrically interconnected, photo-electric means electrically connected to said control means, said photo-electric means energizable by said control

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film to actuate said control means to operate said releasing means through said switchboard panel contact means to release a selected scent-laden medium.

2. The structure of claim 1, said control means including supplementary means also energizable by said photo-electric means and control film for repeating the operation of a scent-releasing means.

3. The structure of claim 1, scent neutralizing means, said switchboard panel including an electrical connection energizable by said photo-electric means and control film to actuate said scent neutralizing means.

4. In a device to release scents to accompany the showing of motion pictures, a motion picture film projector and a control member actuated thereby, a plurality of scent-laden mediums normally confined, releasing means for each of said scent-laden mediums, a switchboard panel having a plurality of selector contact means corresponding in number to said releasing means, control means for said panel all electrically interconnected, means for electrically connecting said selector contact means to selected ones of said scent releasing means, and means actuated by said control member to actuate said

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control means and energize said switchboard panel contact means to operate said selected scent releasing means in sequence, said control means comprising a motor, a rotatable disc operated thereby and a plurality of switches electrically connected to said switchboard panel contact means, said switches actuatable by said rotatable disc.

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