

# (12) United States Patent

### Shirai et al.

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### (54) PATCHES CONTAINING TULOBUTEROL

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(51) Int. Cl.

A61F 13/02 (2006.01)

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(58) Field of Classification Search ...... None See application file for complete search history.

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### (57)ABSTRACT

A patch containing tulobuterol in the low concentration and having the stable release-controllability, prepared by laminating an adhesive layer consisting of a rubber, an adhesive resin and a plasticizer on a backing, wherein 1 to 4 w/w % of tulobuterol in the lower concentration as an active ingredient and 0.1 to 3 w/w % of a higher fatty acid as a drug-releasing controlling agent are contained in the adhesive layer.

### 4 Claims, 4 Drawing Sheets



<sup>\*</sup> cited by examiner

FIG 1

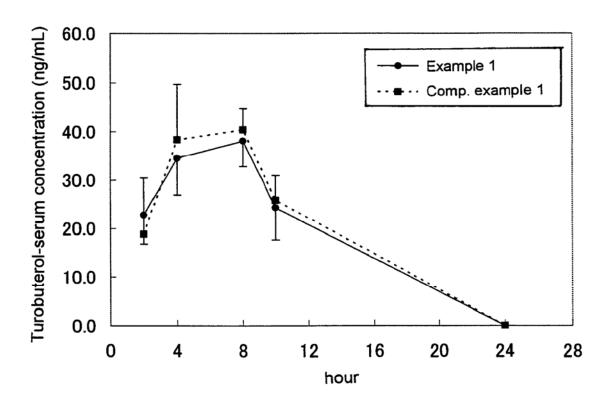


FIG 2 250 Permeation amount of turobuterol (µg/cm²) n = 3Example 1 Comp. example 2 200 Comp. example 3 150 100 50 4 8 12 16 20 24 0 hour

FIG 3

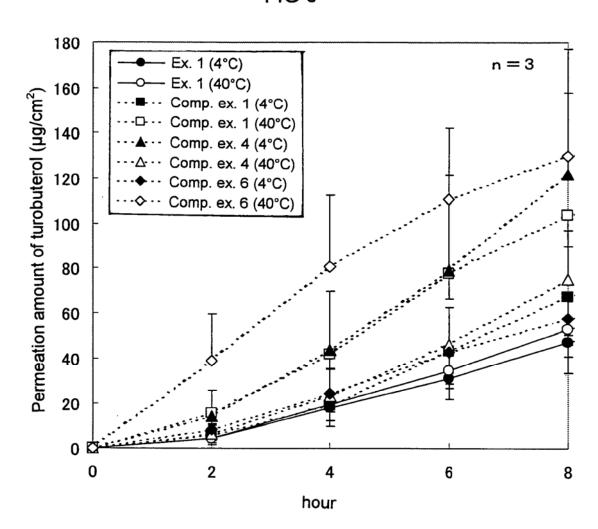


FIG 4 120 n = 3Ex. 4 (12 hours) Ex. 4 (2 months) Permeation amount of turobuterol (µg/cm²) 100 Comp. ex. 5 (12 hours) -- Comp. ex. 5 (2 months) 80 60 40 20 2 0 6 8 hour

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