

Title (en)
System for detection and monitoring of deep land subsidence

Title (de)
System zur Erkennung und Überwachung einer tiefen Bodenabsenkung

Title (fr)
Système pour la détection et le contrôle de l'affaissement en profondeur

Publication
EP 2275642 A1 20110119 (EN)

Application
EP 09425290 A 20090717

Priority
EP 09425290 A 20090717

Abstract (en)
System (30) for detection and monitoring of deep settlements - subsidence phenomena - formed by: - a number of ground wells (3), each housing a vertical measuring system, said vertical measuring system being further composed of: an anchorage point (8), called benchmark, that is installed at the deep end (5) of each well (3) and fixed to the surrounding soil; one rod (at least) (4b) fixed to said anchorage point (8), and extending upwards along the entire length of said well (3) up to the ground surface, the above said rod (4b) is lowered in a sleeve protection tube (4) to keep it free from friction due to the surrounding soil; a system measuring the displacement occurring between the said rod (4b) fixed to the deep anchorage point (8) and the soil surface, the system is characterized by the fact of comprising: - a counterbalancing device (2), installed on the surface, composed of a scale with specific weights (11) holding one or more of said rods (4b), and keeping them in a static equilibrium, along the exact direction of their respective axis; - a number of telescopic sleeves (6), that are integrated in the said protective casing (4), each (21) being firmly screwed on the upper part and free to slide along the lower part; each sleeve (21) houses a spacing collar to center and let the rod slide free (23); - at least one thermal compensation sleeve (9), integrated in said protective casing (4), composed of at least two different materials with different thermal expansion coefficients. so that the measuring system (1) detects the distance between two points: one at the far end of the rod (4b) and the other at the far end of the casing (4); such a distance represents the measurement of the subsidence phenomenon occurring on the area; all the above measurements being independent of geometrical deformations of well profiles (3), and of environmental thermal variations, if any.

IPC 8 full level
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E21B 17/073 (2013.01); **E21B 47/04** (2013.01); **E21B 49/006** (2013.01)

Citation (applicant)
• US 4382335 A 19830510 - FRANK DONALD N
• US 4291581 A 19810929 - JACOBY CHARLES H
• US 5005422 A 19910409 - RUSCEV MARIO [FR], et al
• JP H06137905 B
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• "International Hydrological Programme, Working Group", article "Guidebook to studies of land subsidence due to ground-water withdrawal"

Citation (search report)
[X] ROBOTTI F. & CREAM M.: "Ground subsidence control by deep-well special survey system", 3RD INT. CONFERENCE ON PROTECTION OF STRUCTURES AGAINST HAZARDS, 28 September 2006 (2006-09-28), Venice, pages 243 - 250, XP008116033

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