



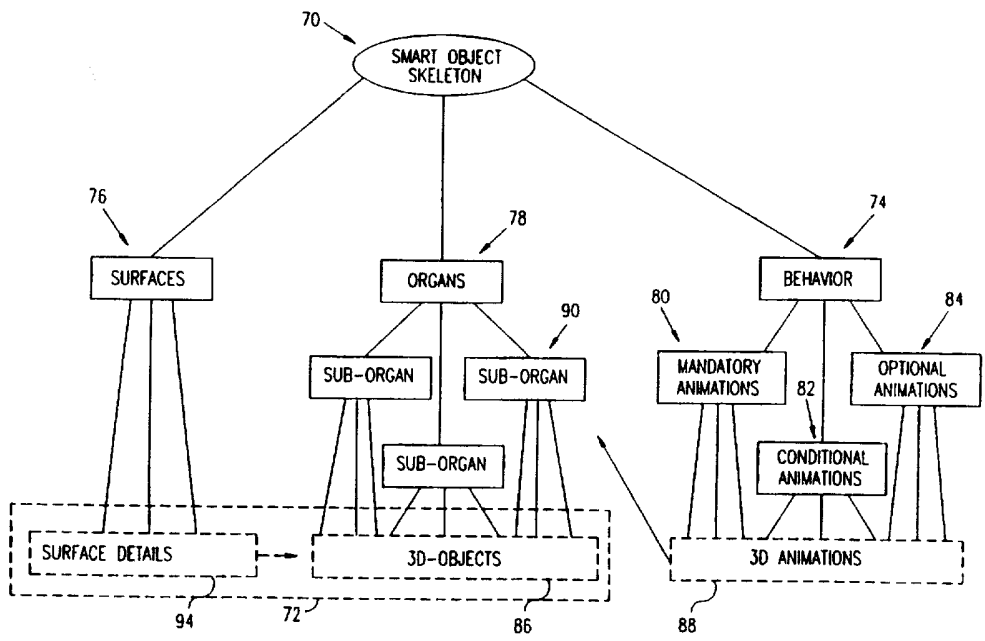
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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 11 December 1997 (11.12.97)

**(54) Title:** SYSTEM FOR PRODUCING AN ANIMATION SEQUENCE ACCORDING TO CHARACTER BEHAVIOUR CHARACTERISTICS



**(57) Abstract**  
 A method for producing an animation sequence on a graphic display driven by a computer, including defining an object (70) that includes a geometrical description of an animated character (76, 78) and characteristics of social behaviour (74) of the character and animating an image of the character responsive to the characteristics (88). The character is programmed with a predetermined response, such as a rule governing motion of the character, to a sensitivity condition occurring externally to the object. The geometrical description of the object includes a geometrical skeleton characterized by a hierarchy of sub-objects connected by joints, the rule governing motion defines motions of the joints.

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INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL97/00093

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(6) :G06T 15/70  
US CL :345/474

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/474, 473

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS  
search terms: animat?; character; behavior; motion or temporal; plan?

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JUNG et al. Animated Human Agents with Motion Planning Capability for 3D-Space Postural Goals. Journal of Visualization and Computer Animation. October 1994. Vol. 5, pages 225-246.	1-5, 19-21, 65-69, 83-85.
X	KOKKEVIS et al. Autonomous Animation and Control of Four-Legged Animals. Proceedings of Graphics Interface '95. 17 MAY 1995. Pages 10-17.	1-5, 19-21, 65-69, 83-85.
X	BADLER, N. I. Human Task Animation. NCGA '89 Conference Proceedings of the 10th Annual Conference and Exposition Dedicated to Computer Graphics. 17 APRIL 1989. Vol. 1. Pages 343-354.	1-5, 19-21, 65-69, 83-85.

Further documents are listed in the continuation of Box C.  See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principles or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*B* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 23 SEPTEMBER 1997	Date of mailing of the international search report 29 OCT 1997
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer JOSEPH R. BURWELL <i>Joni Hill</i> Telephone No. (703) 305-3800

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL97/00093

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MAIOCCHI, R. A Knowledge-Based Approach to the Synthesis of Human Motion. Modeling in Computer Graphics (Proceedings of the IFIP WG 5.10 Working Conference). 8 APRIL 1991. Pages 157-168.	1-5, 19-21, 65-69, 83-85.
X	BADLER, N. I. Artificial Intelligence, Natural Language, and Simulation for Human Animation. Proceedings of Computer Animation '89. 22 JUNE 1989. Pages 19-31.	1-5, 19-21, 65-69, 83-85.

INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL97/00093

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3.  Claims Nos.: 6-18, 22-24, 28, 29, 36, 37, 41-45, 60-64, 70-82, 86-88, 92, 93, 100, 101, 105-109, 114 and 124-128  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
1-5, 19-21, 65-69, and 83-85

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.  
 No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL97/00093

### BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claims 1-5, 19-21, 65-69, and 83-85, drawn to a method and system for producing an animation sequence with behavior of characters.

Group II, claims 25-27, 30, 89-91, and 94, drawn to a method and system for providing a user interface.

Group III, claims 31-35 and 95-99, drawn to a method and system for producing an animation sequence with translation and rendering of various viewpoints.

Group IV, claims 38-40 and 102-104, drawn to a method and system for producing an animated overlay image.

Group V, claims 46-54, 110-113, and 115-118, drawn to a method and system for conveying an animation from a source computer to a destination computer.

Group VI, claims 55-59 and 119-123, drawn to a method and system for finding a desired image among a library of images.

The inventions listed as Groups I-VI do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I contains descriptions of animated characters and their behaviors; Group II contains scaling of display icons; Group III contains a three-dimensional description of a scene with rendering of images from multiple viewpoints; Group IV contains overlaying animated image elements on a window by software unrelated to the generation of the animated image element; Group V contains transmission of an animated object from one computer to another computer; Group VI contains searching through a library of images to a second image which resembles a first image.