United States Patent [19]

Sasaki et al.

[54] **TIME MEASUREMENT APPARATUS AND SYSTEM HAVING RECEPTION OR TRANSMISSION FUNCTION**

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[73] Assignee: **Casio Computer Co., Ltd.**, Tokyo, Japan

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[30] **Foreign Application Priority Data**

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Dec. 27, 1991 [JP] Japan 3-360753

[51] **Int. Cl.^{6}** **G04F 8/00**; G04B 47/00; G08B 23/00

[52] **U.S. Cl.** .... **368/2**; 368/10; 368/113; 340/323 R; 340/ 539; 364/569

[58] **Field of Search** .... 368/10, 11, 107, 368/113, 2, 3, 9; 340/323 R; 364/569; 377/20, 24, 24.2; 235/377, 380, 382, 384, 385

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,714,649 1/1973 Brouwer et al. .
4,074,117 2/1978 Delorean et al. .
4,823,367 4/1989 Kreutzfeld 377/24.2
5,140,307 8/1992 Rebetez et al. 340/539
5,241,487 8/1993 Bianco 364/569
5,245,162 9/1993 Takahashi 235/377

FOREIGN PATENT DOCUMENTS

2-200280 8/1990 Japan .
4-86593 3/1992 Japan .
4-86592 3/1992 Japan .

Primary Examiner—Vit W. Miska
Attorney, Agent, or Firm—Frishauf, Holtz, Goodman, Langer & Chick

[57] **ABSTRACT**

An apparatus designed to automatically measure the total moving time, split times, time lag, and the like of each of a plurality of moving objects, and determine the arriving order of each moving object. Every time a plurality of moving objects, e.g., runners or vehicles, pass through each predetermined point, pieces of information such as total running/ moving times, split times, time lags, and arriving orders are transmitted, in units of moving objects, to the respective moving objects or a transmission/reception unit arranged at each predetermined point. When moving objects pass through a predetermined point, and their moving times exceed passage times set in units of moving objects, an excess time is informed to each moving object.
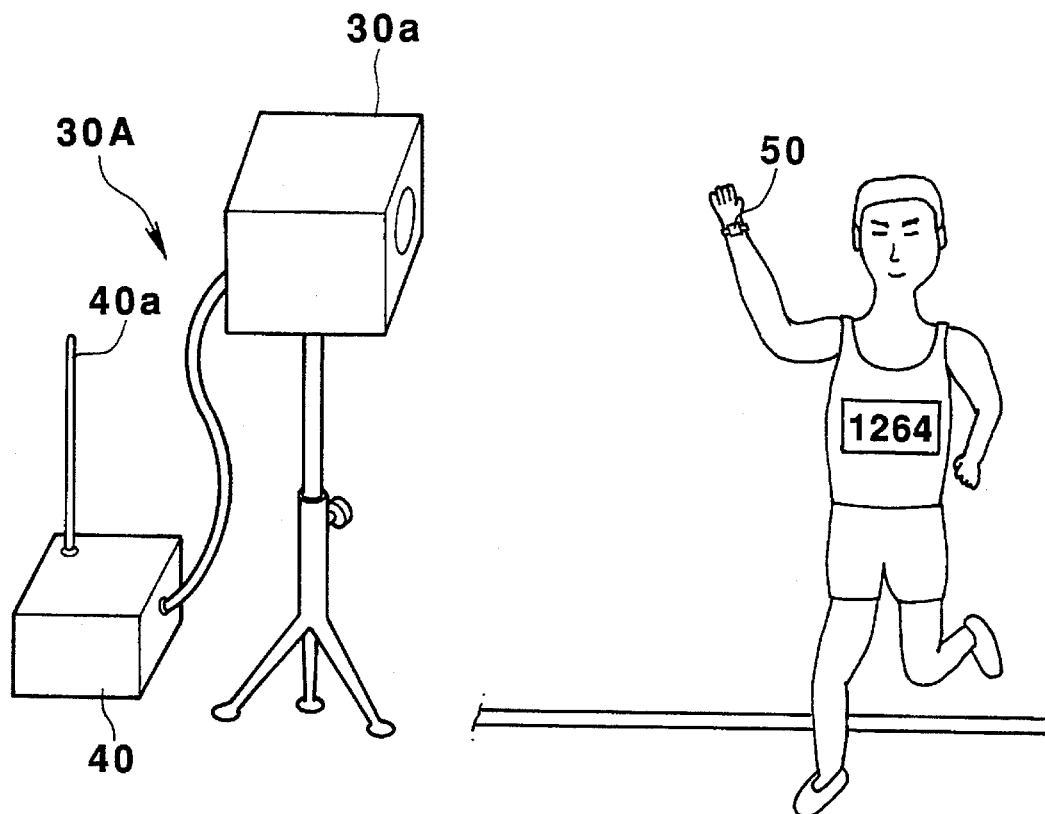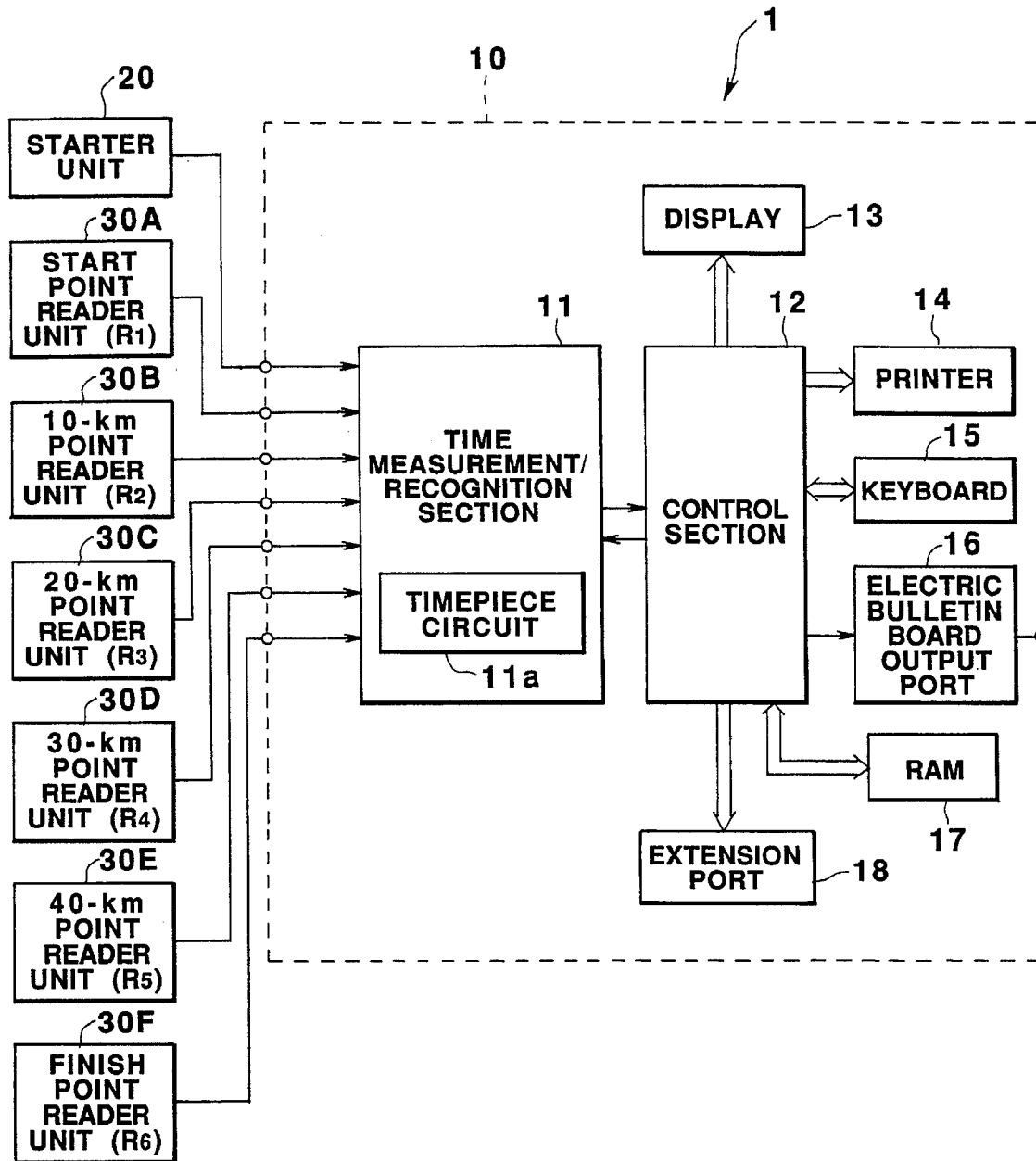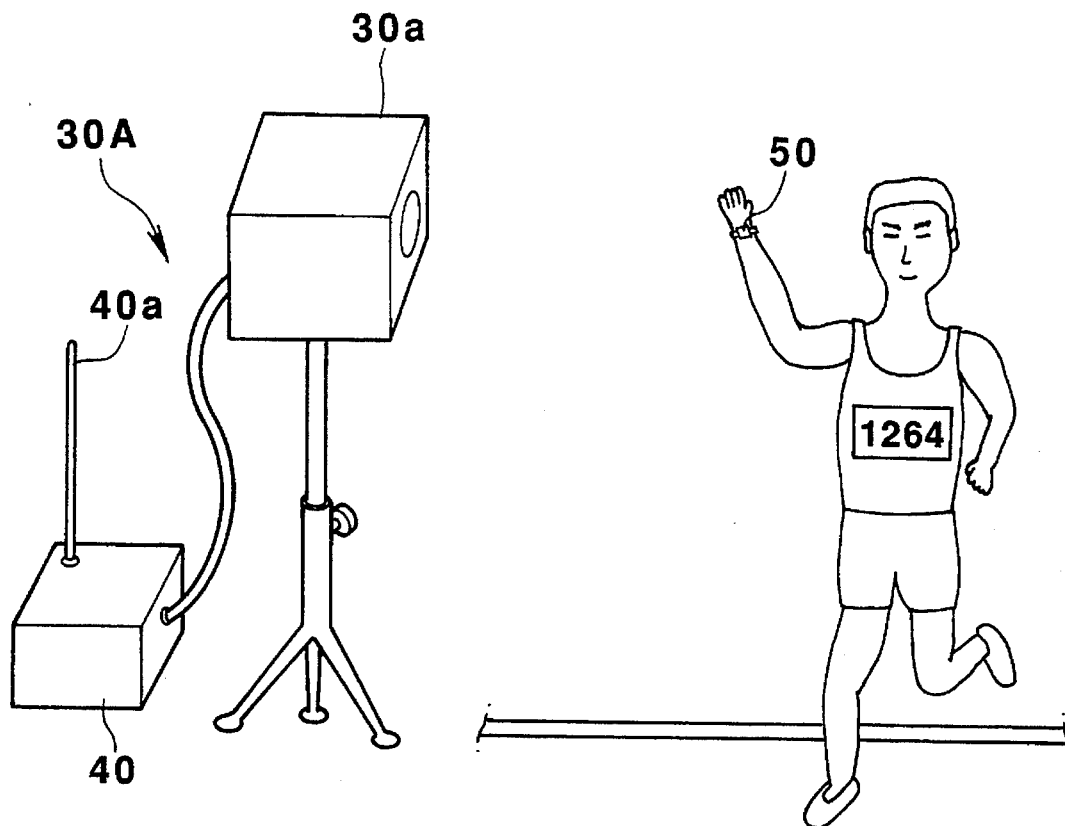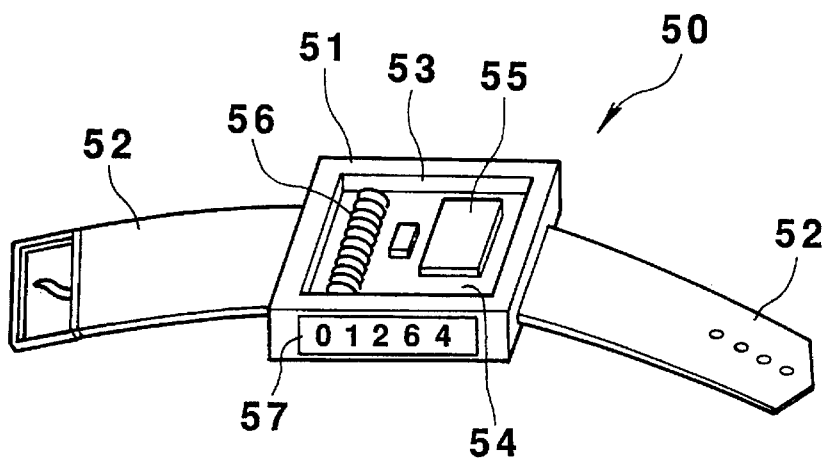
46 Claims, 15 Drawing Sheets

FIG.1

FIG.2

FIG.4

FIG.3

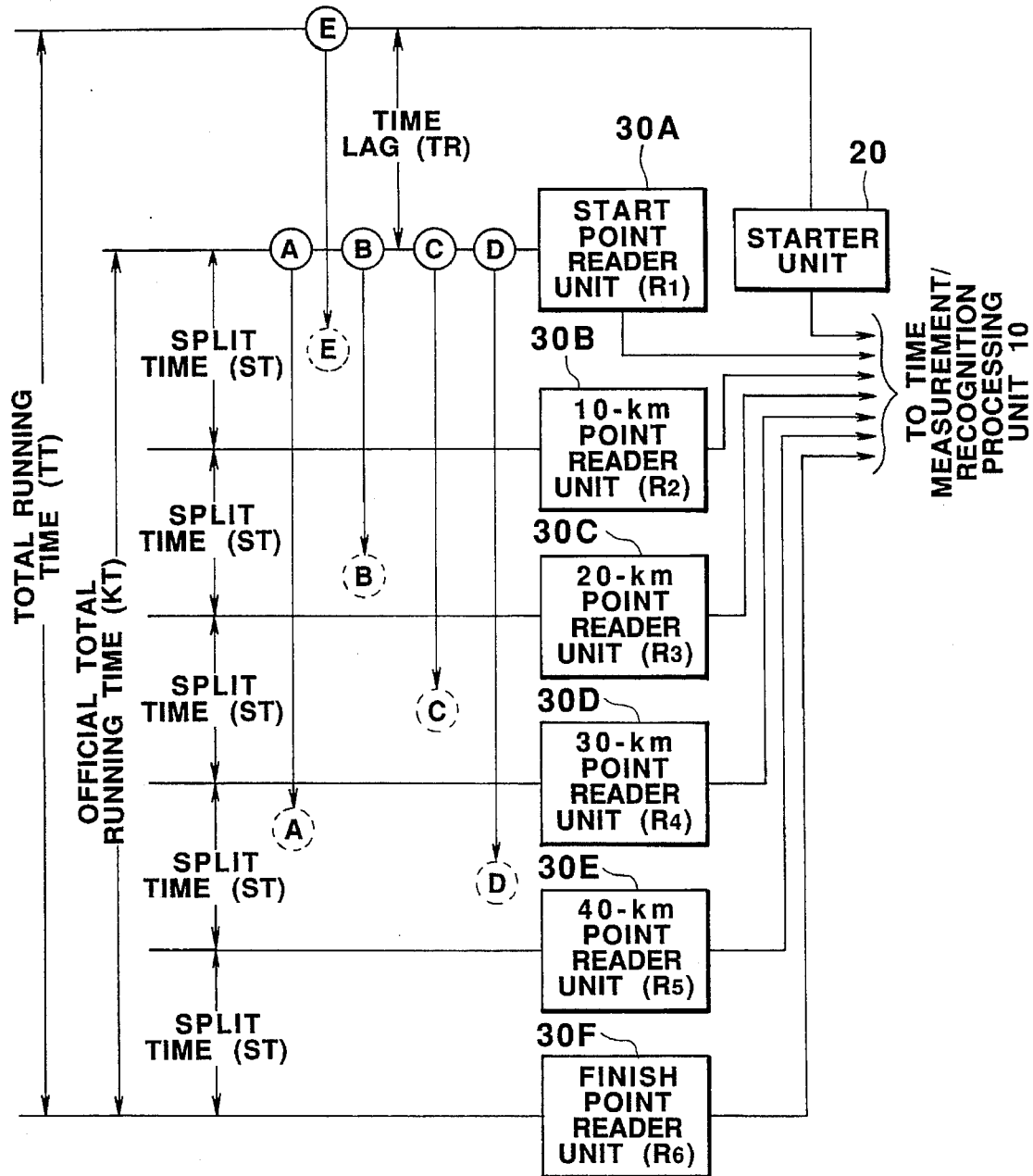| ADDRESS	CONTENTS
100	START TIME INFORMATION SK
200	DISQUALIFICATION NOTIFICATION SET TIME INFORMATION STS
300	DISQUALIFICATION INFORMATION CHT
301	EXCESS TIME INFORMATION CHO

RUNNER A
RUNNER B
RUNNER C
RUNNER D
RUNNER E
⋮
RUNNER N

ADDRESS	CONTENTS
1000	START POINT PASSAGE TIME INFORMATION TZ
1001	10-km POINT PASSAGE TIME INFORMATION TZ
1002	20-km POINT PASSAGE TIME INFORMATION TZ
1003	30-km POINT PASSAGE TIME INFORMATION TZ
1004	40-km POINT PASSAGE TIME INFORMATION TZ
1005	FINISH POINT PASSAGE TIME INFORMATION TZ
1006	TIME LAG INFORMATION TR
1007	TOTAL RUNNING TIME INFORMATION BETWEEN START AND 10-km POINTS TT
1008	TOTAL RUNNING TIME INFORMATION BETWEEN START AND 20-km POINTS TT
1020	OFFICIAL 10-km POINT PASSAGE TINE INFORMATION KZA
1021	OFFICIAL 20-km POINT PASSAGE TINE INFORMATION KZA
1030	SPLIT TIME INFORMATION BETWEEN 10- AND 20-km POINTS ST
1031	SPLIT TIME INFORMATION BETWEEN 20- AND 30-km POINTS ST
1040	ARRIVING ORDER INFORMATION AT 10-km POINT TJ
1041	ARRIVING ORDER INFORMATION AT 20-km POINT TJ
1050	OFFICIAL ARRIVING ORDER INFORMATION AT 10-km POINT KT
1051	OFFICIAL ARRIVING ORDER INFORMATION AT 20-km POINT KT
1060	ARRIVING ORDER INFORMATION BETWEEN 10- AND 20-km POINTS TJ
1061	ARRIVING ORDER INFORMATION BETWEEN 20- AND 30-km POINTS TJ
2000	START POINT PASSAGE TIME INFORMATION TZ
2001	10-km POINT PASSAGE TIME INFORMATION TZ
3000	START POINT PASSAGE TIME INFORMATION TZ
3001	10-km POINT PASSAGE TIME INFORMATION TZ

FIG.5

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