US006293915B1

(54) **PULSE WAVE EXAMINATION APPARATUS, BLOOD PRESSURE MONITOR, PULSE WAVEFORM MONITOR, AND PHARMACOLOGICAL ACTION MONITOR**

(75) Inventors: **Kazuhiko Amano; Kazuo Uebaba**, both of Yokohama; **Hitoshi Ishiyama**, Toride; **Hiroshi Kasahara**, Kashiwa, all of (JP)

(73) Assignee: **Seiko Epson Corporation**, Tokyo (JP)

(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(57)   **ABSTRACT**

An FFT treating section (40) carries out the frequency analysis of a pulse waveform MHj excluding a body movement component to yield pulse wave analysis data MKD and then a tidal wave-character extracting section (50) and a dicrotic wave-character extracting section (60) yield a tidal wave-character data (TWD) and a dicrotic wave-character data (DWD) showing the characteristics of a tidal wave and dicrotic wave respectively. Then, a pulse condition judging section (70) yields pulse condition data (ZD) on the basis of this data (TWD, DWD) and in succession a notifying section (80) advises of the pulse condition of a subject.
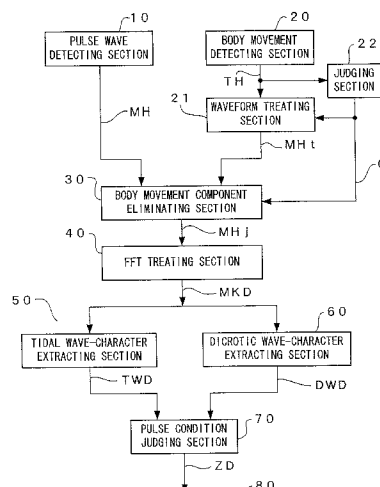
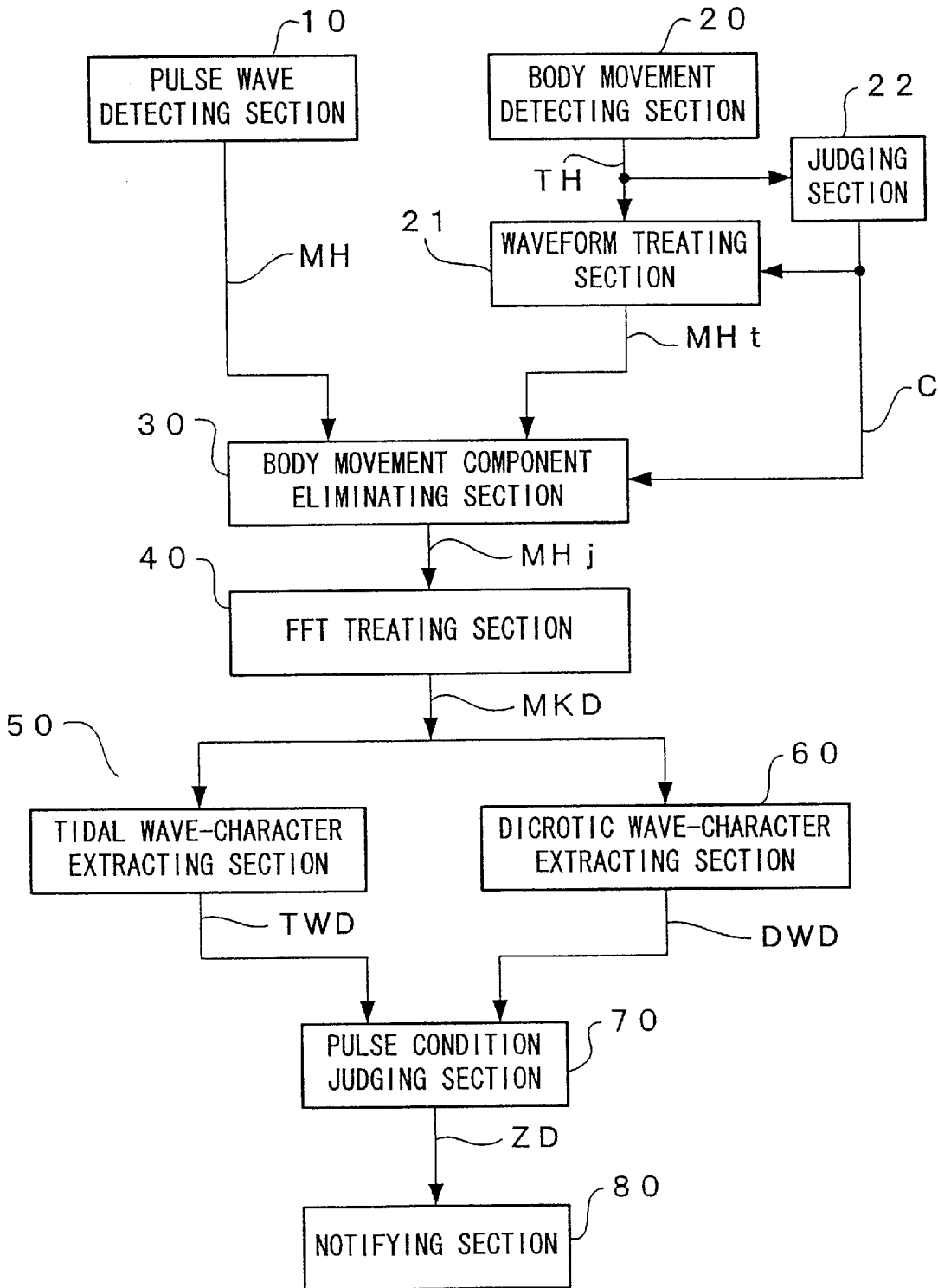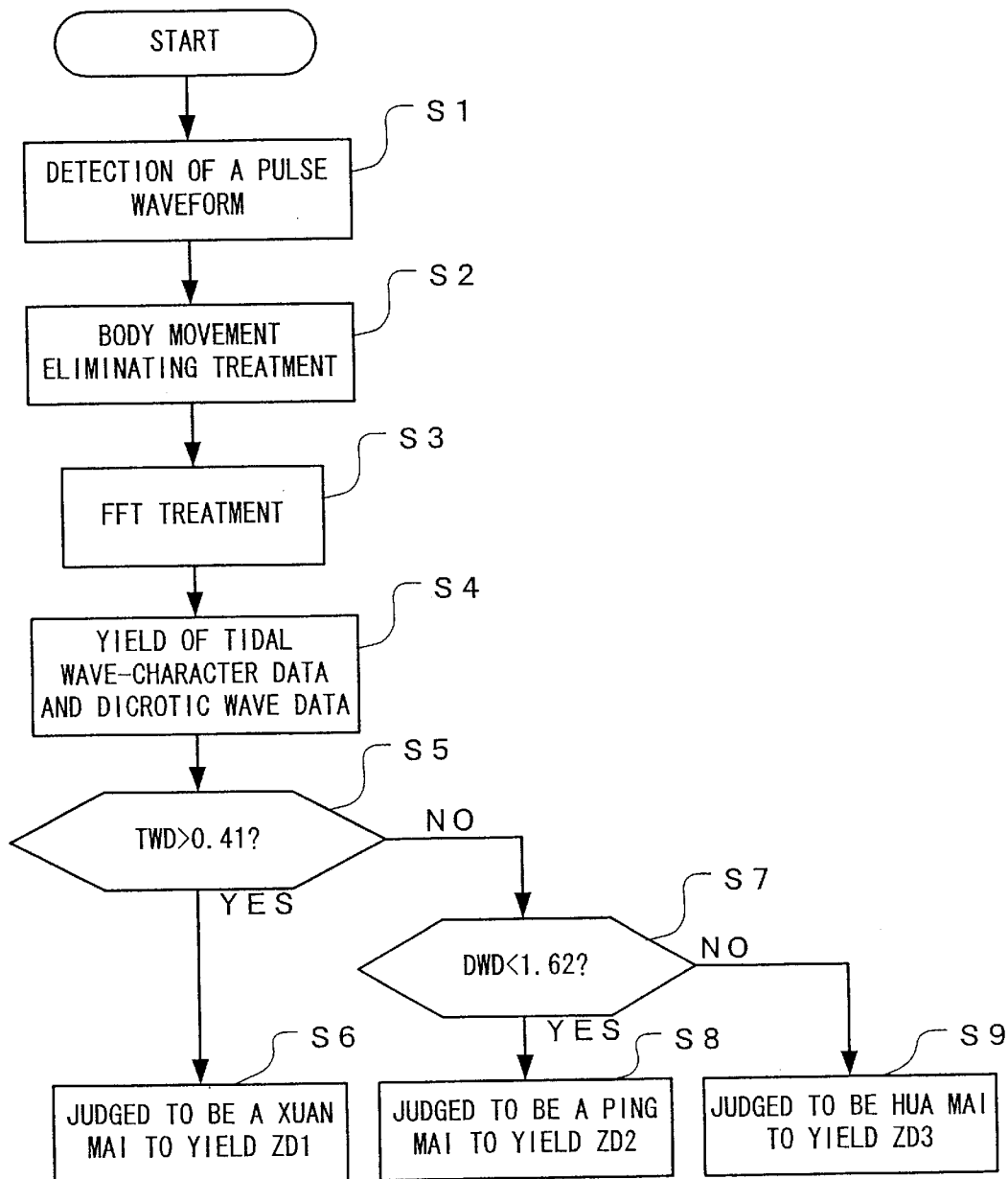**61 Claims, 56 Drawing Sheets**

F I G. 1

F I G. 2


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                        ┌─────────────┐
                        │    START    │
                        └──────┬──────┘
                               │
                   ┌───────────▼──────────┐   S 1
                   │ DETECTION OF A PULSE  │
                   │      WAVEFORM         │
                   └───────────┬──────────┘
                               │
                   ┌───────────▼──────────┐   S 2
                   │   BODY MOVEMENT       │
                   │ ELIMINATING TREATMENT │
                   └───────────┬──────────┘
                               │
                   ┌───────────▼──────────┐   S 3
                   │    FFT TREATMENT      │
                   └───────────┬──────────┘
                               │
                   ┌───────────▼──────────┐   S 4
                   │   YIELD OF TIDAL      │
                   │ WAVE-CHARACTER DATA   │
                   │ AND DICROTIC WAVE DATA│
                   └───────────┬──────────┘
                               │                              S 5
                      ◇ TWD>0.41? ◇ ────── NO ──────┐
                               │                     │
                             YES              ◇ DWD<1.62? ◇ ──── NO ──── S 7
                               │                     │                  │
                        S 6    │              YES    │        S 8       │      S 9
              ┌────────────────▼──┐  ┌───────────────▼──┐  ┌────────────▼─────┐
              │ JUDGED TO BE A XUAN│ │JUDGED TO BE A PING│ │JUDGED TO BE HUA MAI│
              │ MAI TO YIELD ZD1   │ │ MAI TO YIELD ZD2  │ │  TO YIELD ZD3      │
              └────────────────────┘ └───────────────────┘ └────────────────────┘
```

TWD>0.41?

DWD<1.62?

JUDGED TO BE A XUAN MAI TO YIELD ZD1

JUDGED TO BE A PING MAI TO YIELD ZD2

JUDGED TO BE HUA MAI TO YIELD ZD3

F I G. 3

FIG. 4

DOCKET ALARM
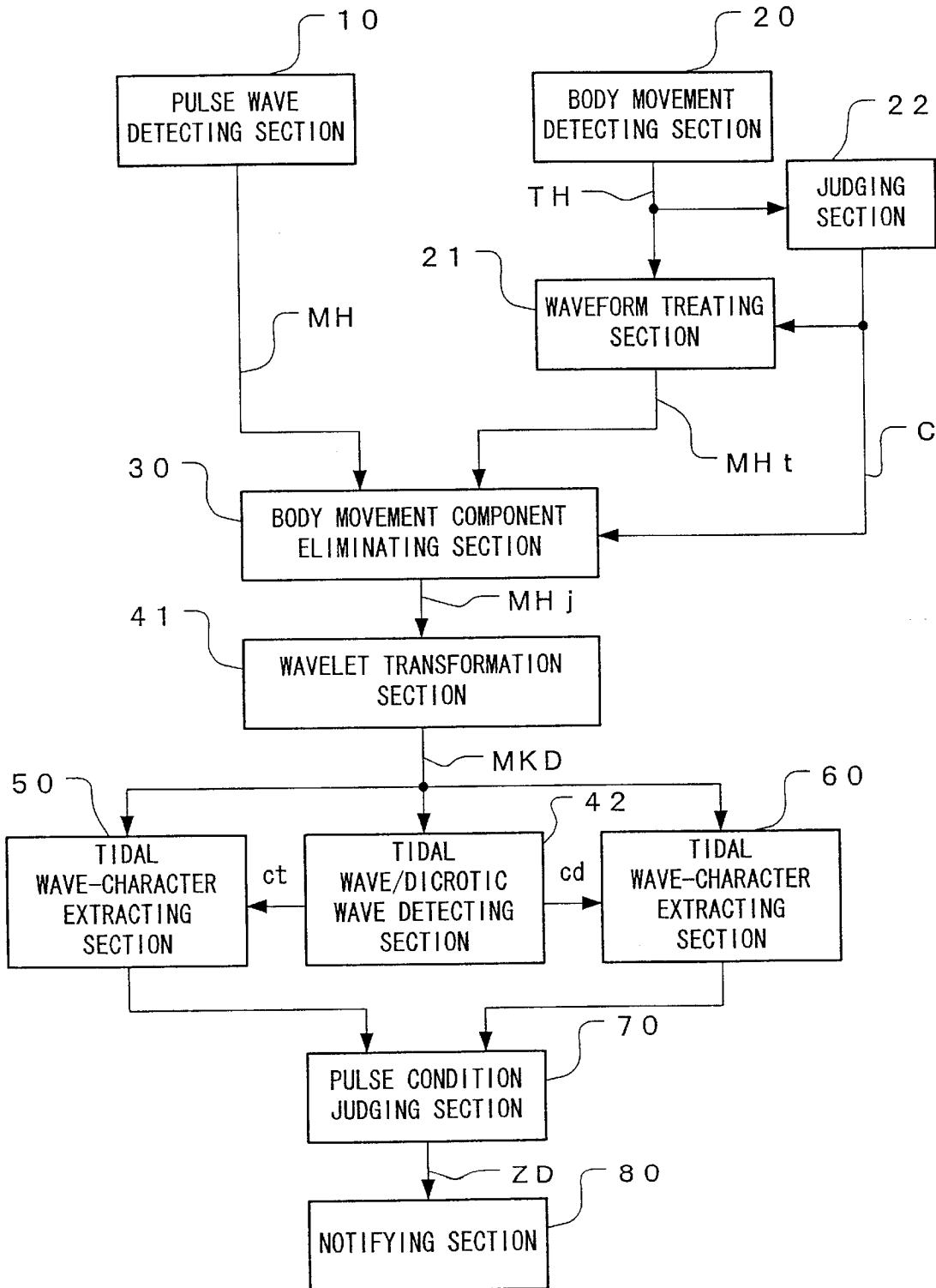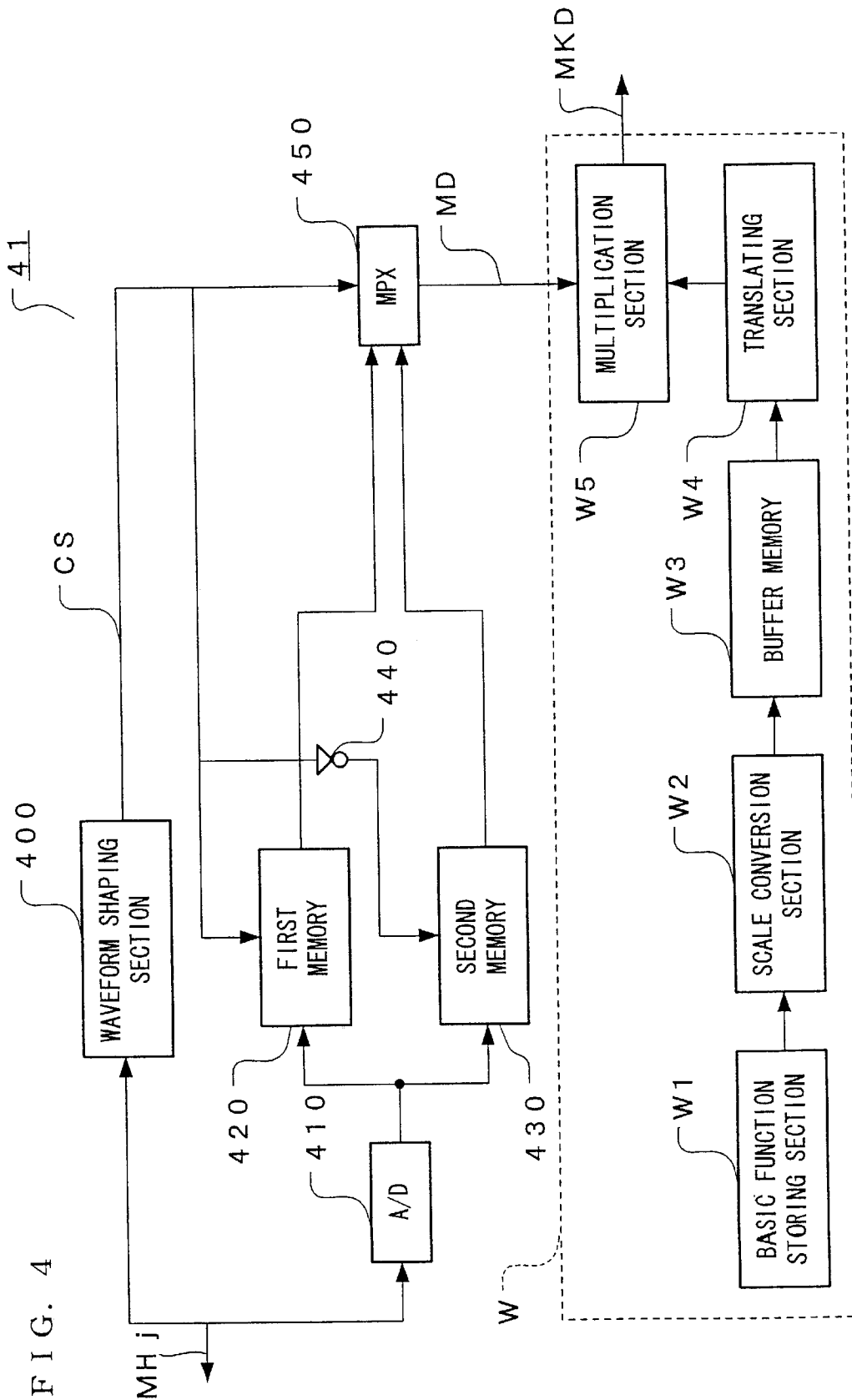
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